

AUTOMOTIVE INDUSTRIES

VOLUME 65

OCTOBER 31, 1931

NUMBER 18

by Leslie Peat

GRIM determination to hold its own in the face of the longest and deepest depression in recent history has fathered fundamental thinking in the industry this past year.

Interviews with scores of motor vehicle and parts manufacturing executives during the past weeks have been an inspiration; all of the self-sufficiency of "success," all of the braggadocio which so often follows brilliant achievement, have been swept away by the violence of the recent financial storms. Men have undertaken to lift a great industry out of the severe difficulties by the simple expediency of that same hardheaded thinking that shaped the automotive business from a hodgepodge of wagon and carriage works, blacksmith sheds and machine shops.

No one can leave the office of the most important automotive magnate in Toledo—one of the hardest-hit manufacturing centers in the country—without realizing that he has seen achievement in the making. There, at the focal point of this distressed city, is the man who is again raising from its new depths a great industry, a great payroll and a great source of tremendous buying-power.

A director of great banking institutions that closed their doors upon two-thirds of the deposits of the entire populace, he is the most potent factor in the reorganization of this financial tangle that added despair to gloom.



New Engineering Ideas and Closer Dealer Relationships Will Brighten 1932 Outlook

Yet this man is emphatic in his belief that the industry will early return to health and strength.

Years ago he led a group of factories from chaos into orderly success. Now he is determined to do it again. Hardheaded planning accomplished the result then. Harder work, fresher ideas and a sure confidence in the future will do it now, he is convinced.

It became evident a year ago that car companies were beginning to turn to their engineering departments* for new ideas to stem the ebb of recession. At important factory conferences today, especial emphasis seems to be laid upon dealer-problems. The specter of broken-down distribution has come home to roost.

One important parts supplier said: "It's been a long time since our factory executives have talked to me about their dealer personnel. A lot of them are realizing now that their dealers have been the neglected cornerstone."

One of the most important car company presidents said: "We expect to make a good showing in 1932 and a better one in 1933 because our dealers are getting a better break and will continue to get a better break. This jolt has recalled to our mind how important distribution is."

These examples of a changed attitude can be supplemented with others showing how some companies have exerted more than ordinary effort in building up dealer good-will.

Several companies have "never worked so hard to improve dealer relationship with the factory," responsible executives confessed.

Several other companies have increased their dealer services and dealer contacts.

Some concerns have written into their financial statements increased losses, in order to give the dealer organization "the breaks."

It was particularly interesting to see that several of the smaller manufacturers have apparently given

up grand dreams of great expansion and have accepted the dictates of economics by agreeing to be openly content with part of the "fringe business."

Executives of lesser lights in the automotive constellation are apparently convinced that today's leading manufacturers must inevitably dominate. Some confided that their bankers have grown tired of fantastical plans for preposterous profits; programs for a sound and normal business on a smaller scale find a warmer welcome from the moneyed men and the men who control money.

There has always been a market for the small makers who offer something individualistic in design and appointments, and a number of companies are promising to startle the lethargic public with their 1932 announcements.

In spite of the Chevrolet, Ford and Plymouth showing during the year and the apparent trend toward greater volume in the lower-priced brackets, several car companies are planning to reduce the number of their chassis models instead of increasing them as was expected some months ago. True, some companies will have several lines to offer, but others will undertake to merchandise a single successful chassis model.

Conservative manufacturers are inclined to be less violent in their attack upon "unmerited gadgets to catch the eye of the public." Free wheeling and the floating power idea have swept away sales barriers magnificently. It has been clearly shown that the salesmen out at the country crossroads and in the traffic-bound centers of population can both use to excellent effect a new sales talk based upon some definite engineering development. "Just another car" is hard to sell nowadays.

It may be expected, therefore, that 1932 will prove the contention that engineering, the father of the industry, is needed today more than ever before. We may expect to see the manufacturers who have been brave enough to gamble with new ideas profit proportionately, if their sales organization can dramatize these ideas to the public.

* "Good Engineering Ideas Will Win Supremacy in 1932," by Norman G. Shidle, page 343, *Automotive Industries*, Sept. 5

Next Week—

the industry speaks

its mind on the Swope Plan for stabilizing business and employment;

in simple language

this momentous scheme is explained, analyzed and made understandable for laymen.

Scores of executives will tell what they think about this most important industrial problem.

We present these ideas next week in a symposium correlated and interpreted by Norman G. Shidle.

JUST AMONG OURSELVES

Fleet Service and Profits

TRUCK and car dealers get more help from vehicle manufacturers in selling automobiles than in devising and carrying out means to make a profit from servicing them. That's natural—but with service profits the backbone of future dealer stability, it's something to think about.

In many respects the vehicle manufacturer isn't equipped to be of major help to his dealers as regards service promotion, although certain factories really have done considerable constructive work. One really important avenue of profit lies open to many truck dealers and to some car dealers, however, which few have traversed and down which factory assistance might well lead the way—FLEET SERVICE.

The Dealer Has a Part

THE average dealer hasn't the slightest idea of how to go about getting fleet service, usually isn't equipped to handle it immediately if it were dumped on him and doesn't see the real profit possibilities in such work.

But there's gold in them fleet service hills!

Most of our inspiration on this subject comes from one of the biggest fleet operators in the country; a company which used to service its own huge fleets and which now has a vast majority

of its work done by dealers—or, where the dealers aren't alert enough to be alive to the opportunity, by independent repair shops.

"Before giving our repair work to outside shops," the head of this big operation tells us, "that is, while we still operated our own repair shops, we found that we had gotten into the automobile business and decided to get out of it, as we felt that we could get our jobs done a lot cheaper and just as effectively by giving the work to outside shops." Then this operator went on to make the following statement:

"The present system has been in operation for a sufficient length of time to prove to us that it is the correct method and we know which way we are heading.

"We do find, however, that we could secure a lot better results if the manufacturer and the dealer would only become fleet-service-minded."

By "fleet-service-minded" he means understanding the special requirements of the fleet operators and equipping to handle them. At least five things are needed:

1. Night service
2. Adequate equipment
3. Satisfactory work
4. Close cooperation
5. FACTORY HELP

The alert dealer can provide all of the things except the fifth. The average dealer, however, will dodge fleet service work rather than go out after it; yet in it

might lie assured profits, service stability and provision of a basis upon which his routine service activities might be materially expanded.

Set the Stage and on With the Show

THERE is a story told of how a big fleet operator decided to give up his own service shop and set out to get the job done by someone of the dealers in a Middle Western town of 30,000 population. Was he besieged with salesmen soliciting the work? Not on your life! He did all the selling—and unsuccessfully for some time. Nobody wanted the job—the night service requirement was the main bugaboo in this case.

Finally one dealer—a Chevrolet dealer we believe it was—conceived the idea of going around to all other small fleet owners in the town and soliciting enough business from them to make profitable a full-time night crew. He did so, took the original big fleet contract, filled up his shop with other business which he had solicited and started in to make money.

Within two months every dealer in the town was around trying to get the business from this particular fleet owner.

With the Factory in a Major Role

HOW can the factory help? Is fleet service promotion worth while for the truck and car factory executives to give real time and energy to?

No one could talk to this particular national fleet operator without feeling that any effort the factory might make would be very much worth while.

As to how they can help—that's a longer story than can be told here. But there will be more space later on.—N.G.S.

Suspension of Gold Standard Forces to Boost Prices While British Makers

by R. J. Politzer

London, England

SUSPENSION of the gold standard by England, equivalent to adding another 25 per cent on the tariff, is seriously threatening the American automobile industry's export trade with Britain. Coming on the eve of the London Motor Show (Oct. 15-24), it is forcing distributors of American cars to increase prices when British manufacturers, from Rolls-Royce downward, are announcing substantial reductions in price.

To meet the situation, the British Society of Motor Manufacturers and Traders, under whose auspices the Olympia Show is held, have relaxed one of their strictest rules and have allowed exhibitors at the show to increase their prices if necessary.

The manner of meeting the changed position differs among different importers as is shown by a number of inquiries as to how the drop in the Pound Sterling will be reflected in the future policy of the distributing company.

Studebaker Distributors, Ltd., states that "owing to the deflation of the Pound Sterling we are unable to import Studebaker merchandise from America. Our margin of profit at anything under \$4.30 is so negligible that we must refrain from bringing any further cars into this country until such time as the Pound Sterling appreciates. It is to be hoped that if the powers that be in America can do anything toward bringing the Pound Sterling nearer tradeable margin it should undoubtedly be done."

Sinclair Motor Concessions, Ltd., distributor of Auburn-Cord, states that while stocks are sufficient to enable them to enter the show without increased prices "the main difficulty will arise should a quotation be asked for a non-stock model, and in such a case the only possible method which can, with any degree of safety, be followed, will be to quote in dollars. Owing to the almost daily fluctuation, it is useless to declare that prices shown in the catalog will be increased by so much per cent, for not only might the cost of the car be unnecessarily increased to an extremely high figure, which would have the effect of frightening off the buyer, but conversely it might be found, when the five or six weeks occupied in delivery from America have passed, that the quoted increase was inadequate, and the vendor would be faced with a serious loss."

This company goes on to voice an opinion which is

representative of the attitude of the importers of American manufactures in England. "There is a possibility that, owing to the undoubtedly bad

financial position prevailing in America, which will tend to become acute before the end of the present year, the dollar value of the pound will have risen sufficiently for a general reversion to prices only slightly above those prevailing before the abandonment of the gold standard to be put into force. There can be no doubt that America will need her export market very badly indeed next year, and, in order to preserve it as far as possible during the present crisis, a great many American firms may have sufficient foresight to foster British importers' interests by assisting them to their utmost by supplying goods at very little above cost price, in order to retain public interest, which whilst extremely difficult and costly to build up, is easily destroyed, and, once destroyed, well nigh impossible to regain."

Warwick Wright, Ltd., distributor for the United Kingdom of Stutz cars, states that while, owing to the fact that they fit English coachwork, they will not be forced to raise prices as much as other distributors of foreign cars, they "have no doubt that some compensating arrangement will be made by the factory to enable them to at any rate carry on."

Pass & Joyce, distributor of the Marmon, is not raising prices at the moment though the necessity to do so is envisaged. Similarly with Willys-Overland, Leonard Williams & Co., Ltd., distributor of Packard and Nash, is unable to make any satisfactory statement.

The Ford car in England is unaffected since so small a proportion is any longer imported that the difference in the exchange will not be appreciable in the cost of the car. Should the present position continue, the prospects of the giant factory which the English company is erecting at Dagenham, near London, will improve materially. The huge export figure on which the Dagenham venture is based has been held

in question in some quarters but the abandonment of the gold standard should enable the English company to supply its continental subsidiaries with cars at a figure considerably below that which they have been paying to Detroit for their supplies. And since further progress in the European markets with their great tariff barriers depends on low cost of supply, Ford

Drop in the value of the Pound Sterling has increased the cost on imported cars and parts. Prices on future deliveries will probably be quoted in Dollars

U. S. Distributors Drop List Figures

should be able to take advantage of conditions and make considerable headway.

In this connection, it is interesting to note that General Motors, Great Britain, Ltd., finds itself in an equally favorable position in England, in view of its possession of complete manufacturing facilities at Luton, Bedfordshire, where Vauxhall Motors, Ltd., is located. This General Motors factory is producing at the present time, from English materials, the Vauxhall passenger car, the Chevrolet passenger car, the Bedford truck and the Chevrolet truck.

General Motors states that there will be no increase of price on Buicks, Cadillacs or LaSalle at any rate until the end of the year when the new models will be announced which would in any case involve readjustment of prices. The company does not believe that a slight increase of price would anyway affect their sales in Britain; even if it did, sale of Buick, Cadillac and LaSalle models only accounts for 5 per cent of the business done by the British subsidiary of General Motors and any loss in this direction will be more than made up by the increased export business being done as a result of the cheaper Pound Sterling with the British Chevrolet and Bedford trucks and the Vauxhall car, all British products of the subsidiary company.

The first of the foreign automobile manufacturers operating in the United Kingdom to raise prices as a result of the drop in the value of the Pound Sterling is Chrysler Motors, Ltd. Rather than suffer from the restlessness which any uncertainty regarding future price policy would be bound to create among the British trade and public alike, the company has purchased sufficient dollars at a single quotation to cover their requirements from the American factory to the end of the year. Price increases range from £26 (\$130 at par) on the De Soto standard sedan to £150 (\$750 at par) on the Chrysler Imperial Eight sedan limousine; truck prices are at present unaffected.

Chrysler is showing at the Olympia Show the first of the new Plymouths to reach England and will shortly inaugurate an advertising campaign to introduce the car to the British public. It had originally been intended to retail the new Plymouth in England at £235 (\$1,175 at par) where it would have competed closely with the Ford whose models range around £215 (\$1,075). However, as a result of the currency position, the new Plymouth will be sold, at first in any



case, at £275 (\$1,375); the price of the British Ford will remain unchanged since it is built almost solely of British materials.

Chrysler claims that on certain of their models for the English market they achieve a 65 per cent British content and it is thought probable that the company will embark on the erection of a factory in England.

Foreign makers may not be the only ones forced to raise their prices in the British market. It is thought in some quarters that the recent striking price reductions announced by British manufacturers have only been rendered possible by using an increasing proportion of foreign material, in which cases prices of some British makes will undoubtedly have to be raised.

It is perhaps significant of the possibilities of free wheeling's becoming anything like so popular with the British motoring public as with the American that Chrysler, who offers free wheeling as optional equipment on all Chrysler, De Soto and Dodge lines in the U.S.A., is not offering the device to English purchasers. Of the Plymouth, of course, it is an integral feature.

Steam Coils Heat the Charging Ovens in the Ford Assembly Plant

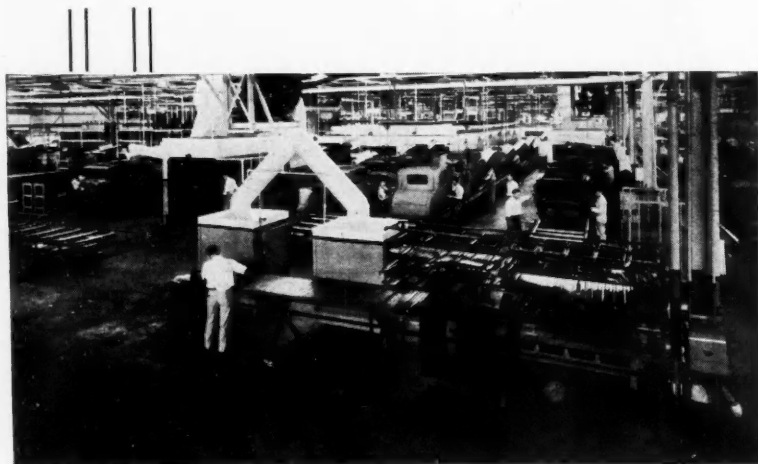
THE different parts of the Ford cars are manufactured at the Dearborn plant of the Ford Motor Company but they are assembled into the finished cars at the various assembly plants scattered throughout the United States. These are the last word in progressive, straight line assembly and the one located in New Orleans, La., exemplifies this to a degree. A spur track divides into a "Y" near one end of the plant, the two branches running along the two opposite sides of the building. The parts are unloaded on a concrete platform on one side, and the finished

Too high a heat applied just as the work comes out of the tanks sets japan before it can drip and smooth out

automobiles are loaded directly into the freight cars on the other side.

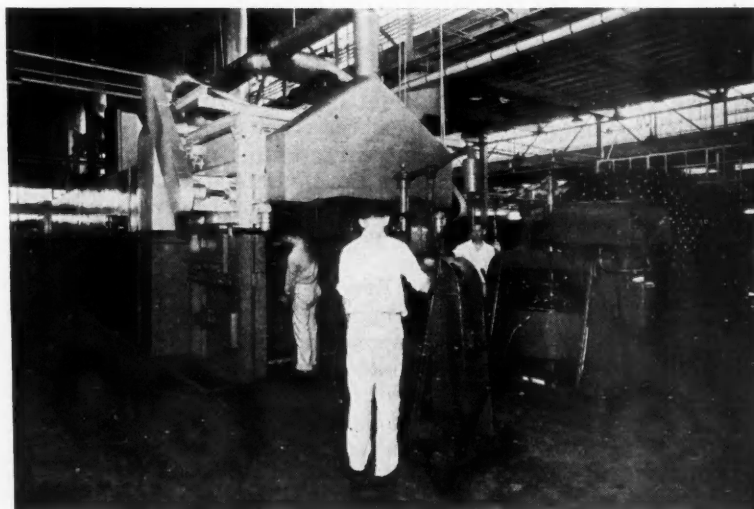
Starting at the unloading dock minor assembly lines terminate at points on the main assembly line where the various sub-assemblies are incorporated. A feature in this plant is the enameling line, included among the minor assembly lines and consisting of dip tanks and gas fired ovens through which operate continuous traveling conveyors. This process is automatic and continuous in operation. The parts are hung on the charging end of the conveyor and removed at the discharge end with the enamel baked on and ready for service.

The enameling unit consists of a washer, burnoff oven, sander, two dip tanks and two bake ovens for two-coat work. The parts enameled include fenders, shields, aprons, hoods, running boards, brackets, etc. The washer is of box construction using plate steel, 4 x 6 ft. in cross section and 55 ft. in length. It is provided with a traveling slat type conveyor and tanks of soda solution and



Above—General view at the Ford assembly plant at New Orleans + +

Right—Wheel paint drying oven. Machine in the foreground immerses wheels in paint and spins them to remove surplus



Ends of the Enamel At New Orleans

by J. B. Nealey

American Gas Association

rinsing water heated to 800 deg. F. by steam from a gas fired boiler. The liquids are forced by pumps through spray jets onto the work as it passes through. The conveyor extends 5 ft. beyond one end for use in loading.

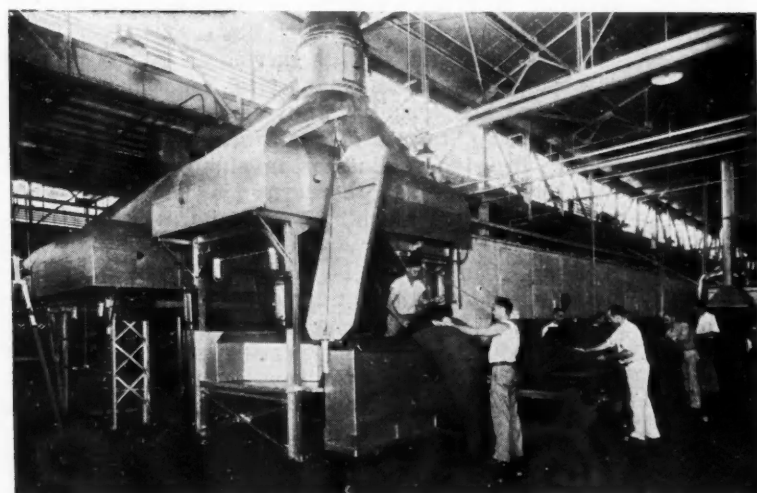
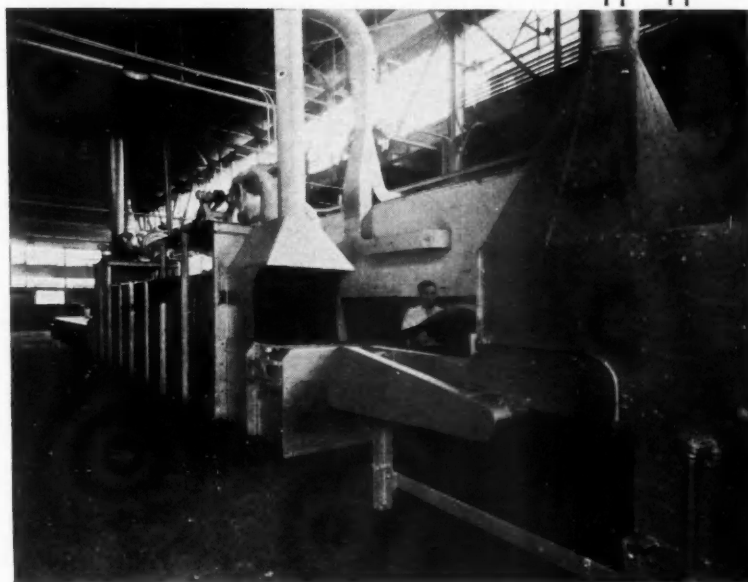
The burnoff oven is used to remove the water and dry the work. It is almost identical in shape and size as the one described except that in the place of the tanks is a series of gas burners (6 in number), which fire under the conveyor. These are of the gas-air proportioning type and the low pressure system of firing is used. A temperature of 750 degrees Fahrenheit is automatically maintained in this oven with the use of a recording controller, connected with a motor operated valve in the air line. The combustible mixture is turned on and off intermittently and mechanically as the temperature varies either way from the degree set on the controller. Waste products of combustion are removed by a fan exhaust at each end. The conveyors of both units are motor operated and the speed of the last so regulated that the work remains in the oven one hour.

The parts then pass along on an open conveyor of the slat type and 45 ft. long. Operators on each side of this mechanically operated conveyor sand the surfaces of the parts in preparation for the enamel.

There are two enamel ovens, set side by side, and each is 110 ft. long, 8 ft. wide and 10 ft. high. Each is equipped with an overhead chain loop convey-

or, driven by a motor through a speed reduction mechanism. They are constructed of sheet steel and held together with structural shapes. There is a fan exhaust at each end. A dip tank at the loading end of each oven holds the liquid japan. An operator dips the parts and hangs them onto the conveyor of the first oven, through which they pass, and at the other end an operator removes them, dips them for the second coat and hangs them onto the conveyor of the second oven

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Above—Operator receiving stock from delivery end of washer and passing it into the burnoff oven

Left—Dipping stock into japan and charging it into oven. Exit end of burnoff oven seen at extreme right

Engineers Need a Post-Graduate



There was no public clamor for the self-starter, but individuals with foresight conceived it, made it work and witnessed its ready acceptance. Evidently, then, it is necessary for the manufacturer to anticipate; and, in so doing, it is wise for him to utilize every possible device that will help him to foretell the essentials of public preference. Our interested and sophisticated automobiling public is the most fertile field for consumer research.

As John Public enters our showroom, we can ignore him or we can wait until he kicks a tire or toots a horn and then ask him what he wants;

but, better yet, we can study him, foresee many of his requirements and have ready for him a product that will match his wishes and his pocketbook.

To succeed in anticipating consumer acceptance, our proper departments must study the individual sales prospect through scientific methods. As it is, "We know too many things that are not true."

Market analysis, as it is carried on by our progressive companies, reveals many vital facts about the consumer and his capacity to buy certain products at certain prices. Statistical, quantitative, coordinated research along these lines is invaluable. The present discussion, however, concerns itself with "what" rather than "how much" the consumer will be eager to accept.

Before headway can be made in matching the user and the product, the fundamental company organization must be right. Those in responsible positions in sales, production and engineering must have a sufficiently broad outlook to draw them from their comfortable offices to where intelligent conclusions from the field of users and prospective purchasers may be made. It should be compulsory for engineering and production executives to spend a sizable portion of their

ONE can scarcely escape the conclusion that automobile manufacturers have succeeded reasonably well in building what the public wants. *Fifty million autos can't be wrong!* At least they can't be all wrong from the standpoint of public acceptance and demand.

But, having built and sold 50 million cars, where do we go from here? We cannot rest upon our laurels, we cannot conquer new worlds with old methods.

The fact that the next few million vehicles will move through rougher territory and tougher competition should prompt manufacturers to exercise unusual intelligence, aggressiveness and foresight in adopting sound and scientific means to determine what will be most acceptable to the prospective purchaser.

Automobile manufacturers today are not only willing, but are eager, to listen to public demand. There is a misconception, however, in the minds of many as to the definiteness of public demand. Generally speaking, the consumer is inarticulate excepting when he buys the product.

Public demand, did not dictate the features of the first automobile ever marketed; yet that automobile was bought and many millions have been bought since.

Course in Consumer Research

They should be torn bodily from desk and shop
and thrust into the field for the good of their
souls and sales + + + + +

Says John A. C. Warner*

time in direct contact with field conditions.

In addition to obtaining technical information for factory use, the engineer can often benefit the field representatives by giving them useful advice and by assisting with important prospects. Recently, a business deal, running well into six figures, was shifted from one company to a competitor simply because the production vice-president and the chief engineer of the successful company just "happened" along to assure the prospect that the factory was prepared and eager to stand behind the equipment with every possible facility and service. A friendly call, properly timed, turned the trick.

Lacking field contacts, our technical men cannot be expected to look beyond the blueprints into the prospect's pocketbook. Why not force the engineering vice-president, the chief engineer and the production manager out on a field trip together into troublesome territory and see what happens? Likely as not, they will come back with many ideas and a refreshed viewpoint—rather pleased with themselves and with each other. They may even return with a healthy respect for the sales department and its problems.

Our consumer-conscious organization has a number of trustworthy gages available for the analysis of consumer requirements and their best embodiment in an automotive vehicle. It is feasible and practical, for example, to measure the product or any projected feature in terms of fundamental characteristics that affect the customer.

To illustrate the point, suppose we ask a few questions. Is this new car, that we are planning, the safest car that we know how to build? Is there any feature of its construction that may in any way introduce hazards that can be avoided?

How about comfort? Is the car designed to carry human beings? Have the various comfort factors been studied or is this just another vehicle, built to sell at a price and to look pretty at the show?

Will the new car be reliable or has it a lot of untried and half-baked features that will rattle off or go "haywire"?

How does it perform? Will it start, accelerate, and stop in accordance with proper standards?

*Abstract of paper before Metropolitan Section, Society of Automotive Engineers, at New York City, Oct. 22, 1931, by Mr. Warner, the General Manager, Society of Automotive Engineers.

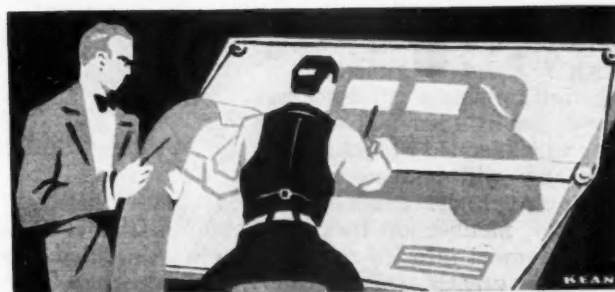
Is it easy to control? Will it hold the road? Can the average woman drive the car safely and without undue fatigue; or are the steering gear, clutch and brake of the two-men-and-a-boy variety?

Will this car enjoy the stewardship of a friendly service organization or will it be disinherited after purchase? A magnificent building, a flat rate system and 497 nicely printed forms do *not* constitute satisfactory service; if they did, we would not have so many devotees of the alley garage.

Qualifying the vehicle in accord with the foregoing fundamentals is an inside job for the engineer; it constitutes an important part of his home work. His action, however, should be predicated very largely upon what he can learn directly or indirectly from the user.

Direct contact with the consumer for purposes of determining his likes, dislikes, foibles and fancies, is often considered to be impractical, costly and of questionable value. But why damn a method on the basis of results that have come from attempts executed awkwardly, often by incompetent and untrained persons? At least one manufacturer, who will be even more successful in business ten years from the present time than he is today, is now working up a consumer department of trained observers and investigators who are examining directly and indirectly the genus consumer, his haunts, habits and environments.

One might inquire why the essential information
(Turn to page 706, please)



American Engine Builders Are Not Expiration of Knight Patents

Granting of patent for sleeve-valve engine to printer-inventor ushered in a period of poppet valve development toward present-day powerplant refinements + + + + +

EARLY next year the principal U. S. patent on the Knight sleeve-valve engine will expire, and thereafter any manufacturer in this country inclined to do so will be free to produce engines with double sleeve valves for the market. In view of the more recent history of the industry it is not at all likely that any section of the industry will take advantage of the patent expiration, and the event is of importance chiefly as recalling the very considerable influence the introduction of the sleeve-valve engine had on the design of internal combustion engines generally. The story of the Knight engine is of interest also as furnishing perhaps the only instance where an outsider, whose only experience with engines was derived from the ownership and use of an automobile, proposed a radical change in design that received the recognition of leading manufacturers in all of the European countries and that netted him royalties running into the millions.

Charles Y. Knight, the inventor of the engine, was a Hoosier by birth and after leaving school he learned the printer's trade. As a journeyman printer he worked in various cities of the Middle West, and just previous to his development of the sleeve-valve engine he was active as publisher, in Chicago, of *Dairy Produce*, a periodical publication founded by himself. In his business as a publisher he made use of a Knox air-cooled car which, as old-timers in the industry will remember, had a single-cylinder engine with a large number of threaded pins screwed into its cylinder wall, to greatly enlarge the

cooling area. This engine had its valves in the head, and the valve gear is reported to have been very noisy, which was the cause of Knight applying his inventive faculties to engine development.

His chief object was to devise an engine in which the valve action should be silent, and he called his engine the Silent Knight. However, the engine conceived by him in 1904 is not the one that later on achieved a striking commercial success. In this first engine the cylinder (which was of the air-cooled type) was reciprocated relative to a stationary crankcase, ports in the cylinder wall coacting with ports in the cylinder head. This engine was protected by U. S. Patent No. 968166, application for which was filed on April 4, 1904, the patent being issued on Aug. 23, 1910.

It must have soon dawned upon Knight that the reciprocation of the heavy, exposed cylinder was open to serious objections, and he then originated the double-sleeve type of engine which was destined to play an important part in automobile history. In this engine there are two sleeves performing valve functions, one telescoping the other and both located between the cylinder wall and the piston. Both sleeves had a reciprocating motion imparted to them by a half-speed shaft carrying eccentrics, short links or connecting rods extending from these eccentrics to lugs on the lower ends of the sleeves. At the upper end the sleeves extended into an annular space between the cylinder wall and the cylinder head, which latter was sunk into the cylinder. There were two



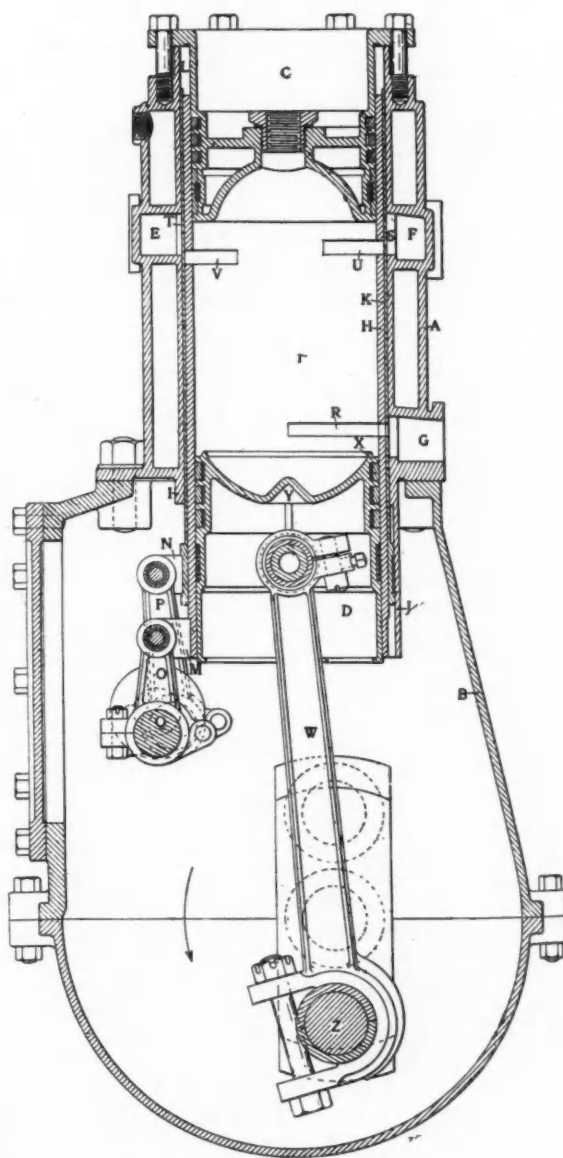
Charles Y. Knight, the printer, who invented the only successful departure from poppet valve engines

Expected to Take Advantage of the

series of ports in each of the sleeves and in the cylinder wall, one for the inlet and the other for the exhaust, and the valve or port was open when all three corresponding ports were in register.

Knight formed a partnership with L. B. Kilbourne, and in 1905 a 35-40 hp. car was built in Chicago. It was then decided, however, to seek to interest established automobile manufacturers in the engine, and Knight during the next year or two called on the majority of the going concerns in this country, offering a license arrangement. His efforts may have been hampered to some extent by the fact that he had as yet no patent protection; at any rate, he found it impossible to interest American manufacturers, and having satisfied himself that nothing was to be accomplished here, he went to England.

This was in the summer of 1907. He took with him a four-cylinder open car which he demonstrated to a number of British makers. His claims for silent operation, however, were not borne out by the demonstrations, and his offers were courteously rejected by all except Percy G. Martin, the American manager of the Daimler Motor Co. of Coventry. Martin thought he saw possibilities in the engine and had it removed from the chassis and placed on the testing block, where its power was materially increased by a few trivial alterations. The failure of the engine to operate silently was probably due to the fact that its timing shaft was driven by ordinary metallic spur gears, which with the high pitchline velocities required in high-speed engines and the imperfect production methods of the period could not be made to operate noiselessly. Later on these gears were replaced by toothed chains or—as they were then known—silent chains.



First Knight engine built in 1905

The Daimler Motor Co. (1904) was the successor of a company originally formed to exploit the British patents of Gottlieb Daimler. It had long occupied a prominent position in the British automobile industry, and had been unusually prosperous, having earned no less than 22.5 per cent on its share capital during the year 1906. But latterly its luck had changed for the worse. As often happens when a manufacturing concern takes over a product developed in a foreign country and does not take along also the engineering talent that developed it, the product of the Daimler company had become more or less obsolete and other English companies had forged ahead of it. Operating losses were piling up rapidly and the quotations of the company's shares on the London Stock Exchange were dropping correspondingly.

Under these conditions the officials of the company naturally were in the proper mood to try something radical. The company had a reputation for high-class workmanship, and its shop facilities enabled it to properly carry out the rather exacting machining operations required in the production of the thin valve sleeves. Early in 1908 the decision

was therefore made to adopt the Knight engine for regular stock production, for all models of the Daimler line.

Nothing leaked out concerning the decision until just prior to the Olympia (London) Automobile Show in November, 1908. The report made a great impression not only in the British industry but throughout the world, for the publicity in connection with the move was very skillfully handled and news of it was cabled to all of the leading capitals of the world. The impression it made was the greater because of the Daimler company's prominence in the British industry. Its

works covered more ground than that of any other automobile manufacturing firm in the country, and though perhaps not employing the largest number of men, its competitors had to admit that in the field of quality cars at least it was the largest producer.

The arrangements made between Knight & Kilbourne on the one hand and the Daimler Motor Co. on the other were as follows: The Daimler Motor Co. secured a sole license to manufacture the Knight engine in Great Britain, and similar rights were accorded to the Italian Daimler company (controlled by the British Daimler company through stock ownership) for Italy, Panhard & Levassor for France, the Daimler Motor Mfg. Co. (Mercedes) for Germany, and Minerva Motors for Belgium. Later arrangements were made also for the manufacture of the engine by the Sigma Co. of Switzerland and the Russell Co. of Canada. Each of these licensees was entitled to sell cars equipped with Knight engines manufactured by it throughout the world, but could issue no sub-licenses.

His astonishing success in Europe naturally gave Knight new hope of successful negotiations with American manufacturers, especially in view of the fact that in those days the American industry lagged behind its European rivals in the matter of technical development and usually looked abroad for new ideas. While in each of the European countries a single license had been issued for the manufacture of the engine, Knight decided to grant licenses to four manufacturers in the United States, and on this basis negotiations were conducted by him for a considerable time with what he referred to as the "Big Four," viz., Packard, Pierce, Peerless and Locomobile. These four firms at that time occupied about the same positions in the American industry as his various European licensees in their respective countries.

These negotiations, however, came to naught. It was rumored at the time that Knight demanded a royalty of \$100 per engine, which seemed exorbitant even in those days when the American automobile industry was not accustomed to work on the narrow margins of today. The first American license was finally placed with the F. B. Stearns Co. of Cleveland, Ohio, whose chief engineer had been to England in 1909 to study the characteristics and details of production of the Knight engine at the Daimler plant. The second license was acquired by the Stoddard-Dayton Motor Car Co., Dayton, Ohio, the third by the Columbia Motor Car Co. of Hartford, Conn., and the fourth by the Atlas Engine Co. of Indianapolis, Ind. All of these firms are now extinct. Generally, when one of the Knight licensees went out of business, its



L. B. Kilbourne was the partner of Knight in the development of the sleeve-valve engine + + +

Knight license was acquired by some other firm, and engines under Knight patents have been manufactured in this country under the names of Edwards-Knight, Moline-Knight, Sterling-Knight and Willys-Knight, in addition to which the Yellow Coach Mfg. Co. of Chicago secured one of the licenses and built bus and taxicab engines with double-sleeve valves.

That none of the original American Knight licensees have survived must not be counted against the engine, for at least two of them were on their "last legs" when they secured the license and their demise occurred in spite of rather than as a result of their acquisition of the manufacturing rights to the engine.

The adoption of the Knight engine proved to have been a master stroke on the part of the Daimler Motor Co., for while during the last year it manufactured cars equipped with poppet-valve engines its balance sheets showed a loss of £49,000 or nearly a quarter million dollars, during the 10 months ending Sept. 1, 1910, it showed a net profit of £150,000, and in the interval the quotation of its shares on the London Stock Exchange had risen from 16 to 72 shillings.

The introduction of the Knight engine had the effect of greatly stimulating engineering research directed toward the more silent operation of engines of the poppet-valve type, and it also greatly encouraged invention in the field of internal combustion engines with other than poppet valves. In listing the advantages of his engine, Knight placed greatest emphasis on its silence of operation. Other features for which advantages were claimed were the compact, substantially spherical compression chamber, which reduced the loss of heat to the water jackets; the rapid opening and closing, and the large areas of the inlet and exhaust ports; complete machining of the combustion chamber walls, which guaranteed equality of compression volumes; and ready access to the cylinders from the top, the cylinder heads being detachable, in contrast to the prevailing practice of the period.

After the first American licenses had been placed it was realized by all automobile engineers that increased efforts to silence their engines would have to be made in order to meet the prospective competition of the Knight licensees. Up to that time the chief objects of the designers had been to secure the greatest possible power from an engine of given size, and to render the engines more reliable and more durable. The new object could be attained in two ways—either by refining the valve-operating mechanism of existing engines, or by developing other engine types in which the valve function is accomplished by one part sliding over another, rather than by what amounts almost to a ham-

Patents Issued to Charles Y. Knight

For many years past Mr. Knight has been living in Los Angeles, Calif. He continued his researches and inventive activity in the internal combustion engine field, as may be seen from the following list of U. S. patents issued to him to date:

Patent Number	Patent Date	Title	Patent Number	Patent Date	Title
Re. 16,757	Oct. 4, 1927	Mechanism for Facilitating the Starting of Internal Combustion Engines	1,575,692	Mar. 9, 1926	Water Cooling System
968,166	Aug. 23, 1910	Internal Combustion Engine	1,593,903	July 27, 1926	Explosion Engine
1,061,756	May 13, 1913	Piston	1,601,918	Oct. 5, 1926	Piston and Rod Construction
1,072,860	Sept. 9, 1913	Explosion Engine	1,602,797	Oct. 12, 1926	Engine Piston and Piston Rod Assembly
1,090,991	Mar. 24, 1914	Internal Combustion Engine	1,607,130	Nov. 16, 1926	Means for Holding Pistons against Vibrations at ends of Stroke
1,129,104	Feb. 23, 1915	Internal Combustion Engine	1,650,363	Nov. 22, 1927	Cylinder Head Construction
1,136,143	Apr. 20, 1915	Internal Combustion Engine	1,659,979	Feb. 21, 1928	Device for Holding Piston Pins Tight
1,155,071	Sept. 28, 1915	Connecting Means for Internal Combustion Engine	1,722,635	July 30, 1929	Multiple Piston
1,177,040	Mar. 28, 1916	Engine Primer	1,741,994	Dec. 31, 1929	Internal Combustion Engine
1,234,042	July 17, 1917	Circulation System for Internal Combustion Engines	1,744,048	Jan. 21, 1930	Bearing Construction
1,370,454	Mar. 1, 1921	Internal Combustion Engine	1,750,320	Mar. 11, 1930	Metallic Packing and Method of Construction
1,418,719	June 6, 1922	Engine Piston	1,750,321	Mar. 11, 1930	Internal Combustion Engine
1,547,173	July 28, 1925	Propelling Mechanism for Aeroplanes and the like	1,759,510	May 20, 1930	Piston for Motors
			1,769,225	July 1, 1930	Sleeve Valve
			1,794,715	Mar. 3, 1931	Vibration Balancing Mechanism

mering action of one part on another. Much effort was spent along both lines, but eventually it was found possible to render the action of the poppet valve so silent that it met all requirements and that at least when new and in proper adjustment it was quite the equal of the sleeve valve in this respect.

The Knight sleeve-valve engine gained a reputation for reliability during the early years of its production by its excellent showing in official endurance tests. When the British Daimler company started to market its Knight-engined cars it was accused by competitors of foisting upon the public an engine which was entirely untried, and numerous letters referring to the subject appeared in the British motoring papers, which could hardly fail to cause the buying public to feel uncertain regarding the merits of the engine. This induced the company to apply for an official test under the auspices of the Royal Automobile Club of Great Britain. In this test the engine was run on the bench for five and one-half days, under an average load of 38.82 hp., substantially its full rated load, with only two stops, for which no penalties were applied under the rules. At the completion of the first bench test the engine was fitted into a chassis and the latter was driven on Brooklands track, a distance of nearly 2000 miles, at an average speed of about 42 m.p.h. The engine was then again dismantled and subjected to another bench test of five hours duration, in which the average power developed was even greater than during the first test. Finally the engine was completely dismantled, and the judges in their report stated that no wear was noticeable on any of the fitted surfaces. The cylinders and pistons were found to be notably clean, and the valve ports showed no burning or wear. This report quieted the adverse rumors concerning the engine in Great Britain, but, of course, it was seen by comparatively few persons in the United States, so the Moline Automobile Co., one of the licensees in this country, in 1914, staged a somewhat similar test here under the auspices of the Automobile Club of America in New York. In this test the engine ran for 14 days uninterruptedly under nearly full load, and at the end of the run the maximum horsepower devel-

oped was greater than before the test. On the basis of these results the claim was later put forward that the engine improved with age.

A challenge was issued by the Moline Automobile Co. at the time to any manufacturer of poppet-valve engines to equal this test, backed by a sum of \$10,000, which was never taken up, however. On the other hand, a manufacturer of a poppet-valve engine staged a similar test some time later in which the engine was run continuously for three weeks, but in the final test for maximum power it showed a considerable loss of power.

Not very long after the Knight engine had made its successful debut in England, a single-sleeve valve engine (the Burt-McCollum) was launched by the Argyll Motor Car Co. of Glasgow. Knight sued, claiming infringement of his patents, but lost out. In France the Knight patent was declared void and a number of manufacturers besides Panhard-Levassor have been manufacturing double-sleeve valve engines there. In Germany the Daimler company abandoned the manufacture of sleeve-valve engines some years ago, while Minerva in Belgium is continuing their production. Abroad the most prominent exponent of the sleeve-valve engine continues to be the English Daimler company, whose whole line, including one 12-cylinder of high horsepower, is powered with this engine. Some of the more recent developments in the design of sleeve-valve engines abroad have been the adoption of thin-walled sleeves made of steel, and of aluminum alloy cylinders without liners.

In this country it seems that only two of the original Knight licenses are being worked at the present time, one held by Willys-Overland, Inc., and the other by the Yellow Truck & Coach Mfg. Co. Two out of nine models of motor buses manufactured by Yellow Truck & Coach Co. have sleeve-valve engines, while the rest have poppet-valve engines. Willys-Overland, Inc., manufactures the Willys-Knight cars and for a number of years also supplied engines for a light truck built by the Federal Motor Truck Co.

Mr. Knight, the inventor of the engine, has been living in Los Angeles, Calif., for several years.

HOW'S BUSINESS for

As forecast by the
scores of editors of
UNITED BUSINESS PUBLISHERS, Inc.

NOVEMBER?

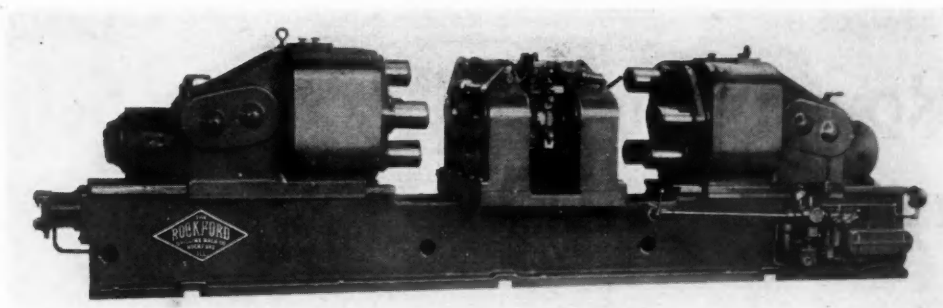
AT no time in the past year has there been such a widespread renewal of confidence. Since credit and confidence have been proven to be synonymous terms, it follows quite naturally that the easing of credit is likewise the stabilization of confidence; and, although the workings of the Hoover Plan may not be so spectacular as its announcement, they will be far-reaching, and give promise for benefits of considerable magnitude in the months ahead.

A typical effect on the manufacturing industries will be the opportunity for replacement of obsolete equipment which, although the need has been fully appreciated, has been handicapped by lack of credit and confidence.

In the merchandising fields the plan seems to promise that a portion of the millions now being hoarded will be diverted to buying. November will witness the completion of the organized drives for welfare funds to be held throughout the country. There is some feeling that they may have an adverse effect upon trade, and it is undoubtedly true that a great deal of responsibility rests in the hands of those charged with the publicity for these drives.

However, the first show of decisive action on our domestic affairs has proved a bracing tonic to our confidence, and with present hopes to build upon, and the promise of further constructive action to follow, general improvement in the coming months seems assured.

BUSINESS	SALES	STOCKS	COLLECTIONS	COMMENTS
AUTOMOTIVE	Passenger cars 36% less than October, and 6% less than November, 1930. Trucks 38% and 12% less, respectively.	Passenger cars somewhat smaller than October and considerably under November, 1930. Trucks about the same as October, and somewhat under November, 1930.	Both lines about the same as October, and somewhat better than November, 1930.	Estimated sales of passenger cars for November, 90,000; trucks about 18,500.
DEPARTMENT STORES	About the same as October, but 10% less than November, 1930.	Increase of 5% over October, but 10% less than November, 1930.	No change from October, or from November, 1930.	Normally a little under October, department store sales should about equalize in these months.
HARDWARE	Increase of 10% compared to October. Equal in items but a decrease of 12% in dollar volume from November, 1930.	Increase of 20% in stocks over October, but about 5% below November, 1930.	No change from October, but slower than November, 1930.	Many manufacturers' stocks depleted to the point where immediate shipments cannot be made.
INSURANCE	Lower in all lines than in October. Better in life, equal or better in fire and casualty than in November, 1930.	Little change from October, with some improvement in all lines over November, 1930.	All life companies making concentrated drives to lower lapsation records.
JEWELRY	Should show increase over October, and about the same or less than November, 1930.	The same or slightly lower than October, and about the same as November, 1930.	About the same as October; and the same, or with a few local improvements over November, 1930.	Jewelers in many sections looking forward to considerable improvement in November.
MACHINERY METAL PRODUCTS METALS	The outlook is for some gain in steel and pig iron production in November. Automobile manufacturers now placing orders, but railroad requirements depend upon freight rate increase.	The providing of easier credits holds out hope to the machinery and machine tool industries that the volume of replacement buying, long held back, may materialize.	Steel industry has entered upon final quarter without improvement in operations, but with a better outlook for buying, particularly from the automobile and railroad industries.
READY-TO-WEAR	Should show improvement over October, but a little below November, 1930.	About 5% less than October, and lighter than November, 1930.	Very slight change from October, but slower than November, 1930.	More seasonable weather should stimulate buying during November.
SHOES	Sales should be larger, due to seasonal conditions, than in October, but smaller than November, 1930.	Somewhat heavier than October, but considerably lighter than November, 1930.	Possibly slower than October, and somewhat slower than November, 1931.	Retail outlets merchandising at prices the public wants to pay will have a very satisfactory November.



Rockford special machine performed six operations

Automatic Machine Replaces Four Lathes Used for Finishing Special Bearings

A RECENT application of an automatic machine made by the Rockford Drilling Machine Co., Rockford, Ill., to the machining of a special bearing made in halves, proved so efficient that not only was the cost of production reduced but the quality of the work was improved. Four lathes were replaced by the one machine. Many production men probably will be interested in the details of this installation.

To make the operations performed clear, one half of the bearing is illustrated in Fig. 2 and the various operations are indicated. Fig. 1 shows the complete machine as tooled up for this job. The operations are as follows:

1st Station—Operator unloads part from holding fixture with following operations completed, and re-loads with a rough part.

2nd Station—Core-drill, also rough-turn and face, from both ends.

3rd Station—Semi-finish bore, also finish-turn and face, as well as chamfer, from both ends.

4th Station—Take rough cut on recess at center of bore.

5th Station—Take finish cut on recess.

6th Station—Final ream.

Owing to the fact that the one machine was to be used on large as well as small parts, it was furnished in the heavy-duty size, to insure ruggedness and elimination of chatter, and to secure the extreme accuracy required. Some of the constructional features are described as follows:

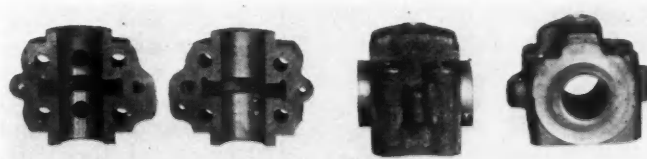
The motor drives

directly into each machine head through a duplex worm and worm-gear reduction, and through spur pick-off gears which permit securing speed changes. A clutch is also incorporated in the drive, giving control of spindle rotation independent of the motors. All working parts within the drive are lubricated by an oil bath, and Timken taper roller bearings are used throughout.

The spindles in each head are built up into a separate unit, known as the spindle-unit, which fits into the front compartment of the machine head, being doweled and bolted thereto. The main driver of the spindle-unit connects with the driver of the machine head. Spindles in this unit are also mounted in Timken taper roller bearings, and oil-bath lubrication is provided. The advantage of this unit construction lies in the possibility of interchanging the spindle-units, so as to readily adapt a machine to changes in the part for which the machine was originally furnished, or for use on an entirely different part within the range of the machine.

Both machine heads, complete with motors and spindle-units, are traversed back and forth simultaneously by means of a hydraulic pump. An improved control designed by the Rockford Drilling Machine Co. makes possible a complete automatic operation cycle after engagement of the control lever. This cycle consists of rapid forward traverse to a predetermined point where the tools are about to start working; automatically slow up to the proper feed; feed the required dis-

(Turn to page 708)



This special bearing made in halves shows the operations of the special machine + + + + + + + + + +

Rolls-Royce Engine Used in Schneider Trophy Contest Developed 2300 Hp.

Air intake temperature was an important point, for it was found that when this rose 18 deg. Fahr., the output fell as much as 100 hp. + + + +

THE Air Ministry has authorized the publication of some particulars concerning the Rolls-Royce engine used in the British seaplanes in this year's Schneider Trophy contest. It is said that although the engine has the same bore and stroke (6 x 6.6 in.) as the 1929 engine, both being supercharged, the 1931 type developed 2300 hp. as compared with 1900 hp., an increase of 21 per cent; and yet the weight was only 100 lb. more, or 6.5 per cent. The 1931 seaplane in flying trim carried 745 lb. more than the 1929 machine without any increase in dimensions, except in the floats, and yet proved safer and more efficient.

It seems that before work on the new engine was commenced last spring a definite standard of performance was set, viz., 2300 hp. at 3200 r.p.m., and it was decided that this power must be maintained for at least one hour on test. This high standard was not reached until three weeks before the contest. At the end of April the experimental engines usually lasted only about 20 minutes before some kind of failure occurred. By the middle of July their life at full throttle had been raised to 30 minutes; on Aug. 3 a run of 58 minutes was done at 2360 hp., and nine days later the full hour's non-stop run was done at 2350 hp.

But even then there was trouble with oil consumption, for on one run of 25 minutes the consumption was at the rate of 112 Imperial gallons per hour.

Oil Consumption Was a Problem

This was partly due to the loss of large quantities of oil through the breathers. Weeks of work followed on combinations of scraper rings and breathers, on modifications of the scavenging system and the provision of a deeper oil sump. These changes led to the reduction of oil consumption to about 14 gal. per hour; the quantity actually carried by the completed machines was 15 gal. The temperature of the oil issuing from the engine was 284 deg. Fahr., which was reduced by the cooling system to 176 deg. Fahr. before the oil was circulated again.

The higher performance of the 1931 engine was obtained by increasing the crankshaft speed, raising the supercharger gear ratio and enlarging the air intake. An important point was air intake temperature, for it was found that when this rose 18 deg.

Fahr., the power output fell by as much as 100 hp.

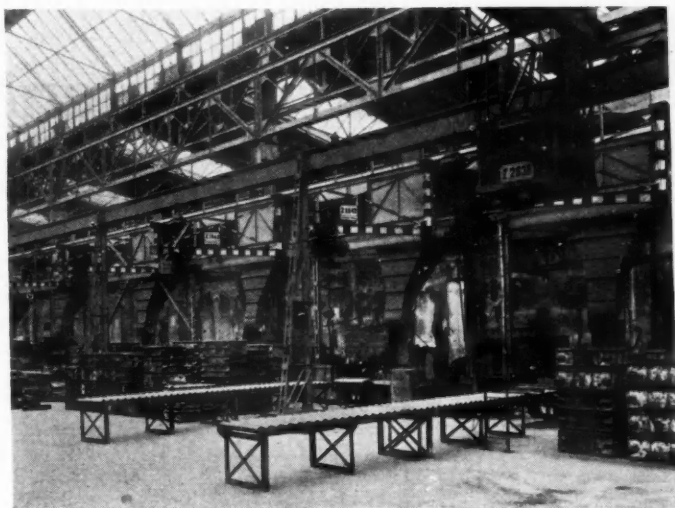
Vibration played havoc in the early stages, particularly affecting the magnetos; every unit had to be secured by a split pin. Materials not usually considered desirable were used for some parts; forged aluminum was used in place of bronze or steel, the substitution being justified only by the comparatively short life that was demanded of the engine.

But even the racing engine was not the final stage of development. The "sprint" engine prepared for attempting to break the speed record (not yet done at the moment of writing) actually develops 300 hp. more (2650 hp.).

1931 Machine Weighed 5995 lb.

As regards the 1931 machine, the floats are longer than on the 1929 model but offer no greater frontal area, and their air resistance per unit of volume is actually less. The wing area and area of control surfaces are the same, though the load is greater. The machine weighs 5995 lb., the excess as compared with the 1929 machine being made up as follows: Engine, 100 lb.; fuel, 165 lb.; oil, 50 lb., and structure, 430 lb. This implies a wing loading of 41.3 lb. per sq. ft., as compared with 36.2 lb. two years ago, and a power loading of 2.6 lb. per hp., as compared with 2.76 lb. The weight of the engine represents 0.71 lb. per hp., as against 0.805 lb. in 1929.

To make use of the higher power, more cooling surface or more efficient cooling had to be provided. In the case of water-cooling this was effected by using the upper surfaces of the floats. The higher loading and higher power meant a higher speed at the take-off, and on the assumption that the higher propeller speed would demand propeller of smaller diameter it was proposed to use one of 12 in. less diameter than that of 1929; but this reduction proved to be too great, for not only did the seaplane fail to get off the water but it was caused also to swing to port at an early stage of taxi-ing. Ultimately a propeller of 109½ in. diameter was used, the earlier type being 114 in. Other dimensions of the 1931 machine are: Span, 30 ft.; chord, 5 ft. 8 in.; wing area, 145 sq. ft.; length, 27 ft. 9 in. and height, 12 ft. Its weight is 4560 lb., and the weight of the propeller, 232 lb.



Photograph by courtesy of W. W. Nichols.

View in gray iron foundry of the Skoda Works, Pilsen. What a remarkably clean looking place for such a gigantic foundry! It's highly mechanized too, as the photo shows. Note the orderly arrangement of cranes and hoists. Also the roller conveyors + + + + + + + +

Production Meeting

Our impression is that the last S.A.E. Production meeting was the most instructive in years. The sessions were not crowded. But those who came are responsible for production in some of the important plants in the industry. It wasn't accidental either that the papers presented here touched on the most vital problems facing production men today. We aim to keep ahead of the parade. Tell the production activity committee what your problems are. It may make a fitting topic for discussion at the next meeting.

Good Painting

Going through a moderate-sized metal working plant in Cleveland, we were impressed by the brightness and clean-cut appearance of the shop. Aside from the orderly arrangement of equipment the whole effect seemed to be created by the use of aluminum paint. Walls, columns, ceiling beams and frames were all generously treated. What a difference some paint makes.

Hidden Values

Mainly to test some things we have learned about unit heaters, we asked a number of questions in a plant which had just installed nice shiny unit heaters all over the shop. As might be expected these were put in because they offered a good

economical source of heat. But, gee whiz, that's only a part of the story. Actually they've acquired much more than that. Did you know that unit heaters can be used to eliminate corrosion due to rusting without any additional rigging? The details are too lengthy to discuss here. But it's all worked out for you. See *Automotive Industries*, Feb. 21, 1931, pp. 256-260.

Such is Life

Things just aren't the same any more. Take foundries for instance. If we were an old-timer (in point of years) we would have tsk'd-tsk'd! on seeing the foundry of the Holley Permanent Mold Co. What, no muck, no smells, and so forth, in a man's foundry? Alas! no. These things are conspicuous by their absence. Just a small shop with a group of high production semi-automatic molding machines. Two men to a machine on a job without cores. An extra man for cored work. And they turn out more work an hour in the small space than the old-timers could turn out in a week.

Clean Bodies

More than one manufacturer was interested in what F. P. Spruance had to say about metal cleaning. Evidently there are still many problems connected with the painting and enameling of bodies and sheet metal parts. Spruance's paper read

PRODUCTION LINES

Impressions from the Middle West

at the Production meeting answers many obscured questions. It will pay you to get a copy of it. We'll be glad to help.

Cutting Costs

This one was heard at the session on inventory control. They agreed that parts makers would have to arrange production more and more flexibly to cope with present schedules. One company has done this by means of a special electric factory truck. It's used in changing heavy press dies. Time required to break down and set up a press has been reduced to a mere fraction.

About Welding

Heard from some body makers present about some more progress in welding. The latest is to make body dies built up of sections welded together. Only the wearing surfaces need be of special alloys. The bulk of the weight can be of ordinary boiler plate. This is real saving.

'Zat So?

No kidding, who does buy the equipment and tool supplies in an automotive plant? We've had occasion recently to debate this very question. Don't forget that in every shop there is one executive higher up responsible for expenditures. Many others have to do with details and selection. But he ultimately sees the requisitions and OK's them—or doesn't.—J. G.



Events in the Development in the United States Are

NOW that automobile manufacture has grown to be the largest industry of the country, there is considerable interest in the circumstances which enabled it to attain this position of preeminence in the relatively short space of less than a third of a century. Consequently, while earlier so-called histories of the automobile dealt chiefly with the work of the pioneers and their productions, the later histories place more emphasis on the industrial and financial growth of the industry and of its components since the automobile became a practical vehicle, without, however, entirely neglecting the early experimental period.

An interesting work of this kind has been written by a German scholar*, Dr. Eva Fluegge, and we have no doubt that if the book were translated into English it would be widely read in this country. The author gathered her material during an extended stay in the United States, having received a grant for the purpose from the Laura Spelman Rockefeller Foundation.

Development Periods Outlined

The history of the automobile industry to date is divided into three periods, and the author points out that any technical industry must pass through these periods. First comes the experimental period, during which a marketable product must be developed. Then follows the production-development period, during which efforts are made to bring down the manufacturing costs to the lowest possible figure; and finally comes the marketing period, during which the chief problem of the industry is to find sufficient outlets for its products. It was the object of the author to outline these periods in the American automobile industry and their chief characteristics. Of course, in a work of 190 pages only the more important developments and tendencies in the industry could be considered. Technical development is discussed only as far as necessary to make the commercial developments understandable.

It is pointed out that during the first or experimental period an industry is in need of a protective atmosphere which enables it to exist while the development work is going on, the assumption being that during this period the industry does not have a product which on strictly utilitarian grounds is worth the price at which it can be sold. The automobile found this "protective atmosphere" in its sport and luxury appeal. This period is said to have covered substantially the first decade of the present century.

It has been asserted by some writers that the industry in the United States during its early years also

The automotive industry has gone through three periods, the experimental period, the production-development period and the marketing period + + +

enjoyed a considerable measure of protection from the high import duty of 45 per cent ad valorem under the Dingley tariff, but the author points out that the policies pursued by European and American manufacturers respectively almost from the beginning were so divergent that little danger threatened the American industry from foreign competition. In America efforts were made from the very beginning to develop a utilitarian vehicle, whereas in Europe all efforts were centered on satisfying the demand for luxury vehicles.

Once a vehicle was developed that was capable of giving satisfactory service as a means of individual transportation, the next problem was to bring down the cost of its production so it could be sold at a price that was acceptable to a large class of potential buyers. During this period, which lasted until the slump of 1920, many improvements in shop methods were inaugurated, including the use of highly specialized or single-purpose production tools, moving-chain assembly lines, etc. During the two periods mentioned the demand for automobiles usually ran ahead of production capacity.

Some attention is given in the book to the influence of standardization on the success of the American industry, and figures are quoted which have frequently been used here in the promotion of standardization work, especially the number of different tubes sizes and the number of different sizes of cap screws in vogue before the standardization movement began. This leads the author to a brief account of the activities of organizations in the industry, the National Association of Automobile Manufacturers, the Association of Licensed Automobile Manufacturers, the National Automobile Chamber of Commerce, and the Society of Automobile Engineers. It is indicative of the high degree of care with which the volume has been compiled that the only slight inaccuracy that came to the attention of the reviewer was a statement in this section to the effect that standardization work was passed on from the Association of Licensed Automobile Manufacturers to the Mechanical Branch of the Society of

* Die Automobilindustrie der Vereinigten Staaten (The Automobile Industry of the United States) by Eva Fluegge, published by Gustav Fischer, Jena, Germany.

of the Automotive Industry Reported by German Author

Two plans of organization have been followed by the Automotive Industry: that of concentration on a single type of car and that of multiple types + + +

Automobile Engineers, whereas actually the transfer was from the Mechanical Branch of the Association of Licensed Automobile Manufacturers to the Society of Automobile Engineers.

It is pointed out that almost from the beginning of the industry in this country two different plans of organization were followed, one being that of concentration on a single type, of which Ford was the foremost exponent, and the other that of multiple types, as exemplified by the lines of General Motors. The author holds that in the case of new market the single-type plan has considerable advantages, as it enables a manufacturer to cut out for himself a certain slice of the market, and develop it very intensively. The unlimited demand in a new market results in an increase in production, which in turn, and especially in the case of a product of such a complicated nature as the automobile, affords increased opportunities through standardization and reduction of production costs. In the author's opinion, what is chiefly to the credit of Henry Ford is the persistence with which he aimed at the production of a low-priced car at a time when the automobile was still very much an experiment, and that he was not diverted by the fact that the time was so propitious for the development of a luxury car.

A considerable portion of the book naturally is devoted to the histories of Ford and General Motors. As regards Ford, there is, of course, much material available in the various Ford books, both "official" and "unofficial," in the records of the Ford-Dodge suit, etc. The history of General Motors is traced from the very beginning, even the original negotiations for a merger of all the important firms of the industry (which was never carried through) being discussed at some length. As sources for the early history of the corporation the author quotes Benjamin Briscoe, *The Inside Story of General Motors*, L. H. Seltzer, *A Financial History of the American Automobile Industry*, Annual Reports of General Motors Corporation of 1909 and 1910, etc. Mention is made also of the short-lived United States Motor Company which was formed by Benjamin Briscoe after the negotiations between him and Durant had come to

naught, and on this subject the author quotes from the unpublished "History of the Maxwell Organization" in the archives of the Chrysler Corporation.

That the original plan of merging all of the more important manufacturing concerns in the automobile industry, which was due to W. C. Durant, failed was due chiefly to the insistence of the Ford Motor Company, voiced through its secretary, James Couzens, for a cash payment of three million dollars. This was followed immediately by a similar demand by Reo, and it was quite impossible to raise that much cash at a time when the automobile industry was still in its infancy and had yet to prove itself a safe field for investment.

Although the original plan failed, Durant continued his negotiations and finally created a nucleus for the General Motors Corporation by merging the Buick and Cadillac companies. During the years 1908 to 1910 he picked up more than twenty automobile and parts companies and merged them in the General Motors Corporation. It is evident from the account given of the merger proceedings that the best judgment was not always shown in the selection of companies, and criticism was passed particularly on the acquisition of the Cartercar Company and the Elmore Company. The former manufactured a car with friction-disk drive and the latter one with a two-stroke engine, both of them features that did not enjoy any great degree of popularity among the buying public. In justification of his acts Durant stated: "How was any one to know the Cartercar wasn't to be the thing? It had the friction drive, and no other car had it. How could I tell what these engineers would say next? Maybe friction drive would be the thing. And then there is Elmore with its two-cycle engine. That's the kind they were using in motor boats; maybe two-cycles was going to be the thing for automobiles. I was for getting every car in sight, playing safe all along the line."

Durant and General Motors

The history of Durant's relations with General Motors is interestingly told. Only a few years after its organization, in 1910, the corporation became involved in financial difficulties and Durant had to retire as president, the management being taken over by a banking group. Unable to exert much influence on the conduct of the corporation (although still a director), Durant in 1911 organized the Chevrolet Motor Company, to build a small car. The rise of this company was phenomenal. Not only was there a great demand for its cars, but its shares soon became a favorite on the New York Curb Exchange and were quoted at high figures. In 1915 the duPonts became interested in the Chevrolet Company and invested some of their large

(Turn to page 708, please)

Atmosphere for Electric Furnaces is

Operation consists of passing city gas and a controlled amount of steam through a chamber at 2000 deg. Fahr. to convert hydrocarbons into free hydrogen and carbon

ELECTRIC furnaces with controlled atmospheres are serving to modernize plants where heat treatment processes are required and manufacturers at this time are investigating their possibilities from every angle in an effort to make better products at lower cost. Some entirely new products have been developed since the advent of furnaces of this type. Bright annealing in protective atmospheres is already becoming a subject of wide scope, and the newly developed copper brazing process is being applied in various factories with excellent results. In the following article three installations of copper brazing equipment are described, pointing out the features of the products which come from the furnaces.

In utilizing the copper brazing process, steel objects are charged into the furnaces with copper applied near the joints, and each assembly is brought up uniformly to a temperature above the melting point of copper, at which stage the copper flows into the seams by the aid of capillary attraction. Upon cooling, strong, high quality unions are made.

Molten copper wets iron surfaces and flows upon them because of the affinity of iron for copper. Ad-

vantage is taken of this fact by using reducing atmospheres in copper-brazing furnaces to remove oxide impurities and prevent reoxidation under heat, so that the copper will have a clean surface upon which to flow.

The Bundy Tubing Co. of Detroit has brought out a new steel tube, made by the copper brazing process, called Bundyweld tubing. Bundyweld steel tubing now is a running mate for the Bundysteel, copper and brass sweated tubing which has had wide application in the automotive industry for gasoline and oil lines, hydraulic brake lines, etc. Both of these types of tubing are made by laterally rolling metal strip into a double-walled tube. The strip is fed into rolling machines where it is carried over stationary arbors that first crimp the sides of the strip, and by successive stages finally roll it into the double-walled tube structure.

This method of fabrication insures uniformity in thickness of the tube wall, the inside and outside diameter being held within limits as close as .003 inch. It also insures absolute cleanliness and freedom from scale on the inside of the tube.

The Bundyweld steel tube is copper welded by applying copper locally to the joints and passing the tubes through a furnace with controlled atmosphere at 2100 deg. F. At this temperature, the copper melts and flows uniformly throughout the seam between the two walls of the tube, alloys and diffuses with the steel, and, upon passage of the tube into a cooling chamber having the same protective atmosphere, the copper-iron alloy freezes, giving a bond of extremely high strength.

Two of the furnaces used for this work are illustrated in Fig. 1. Each furnace is operated continuously, and is capable of producing about 4000 ft. of tubing per hour. Thirty-one strands of tubing in lengths up

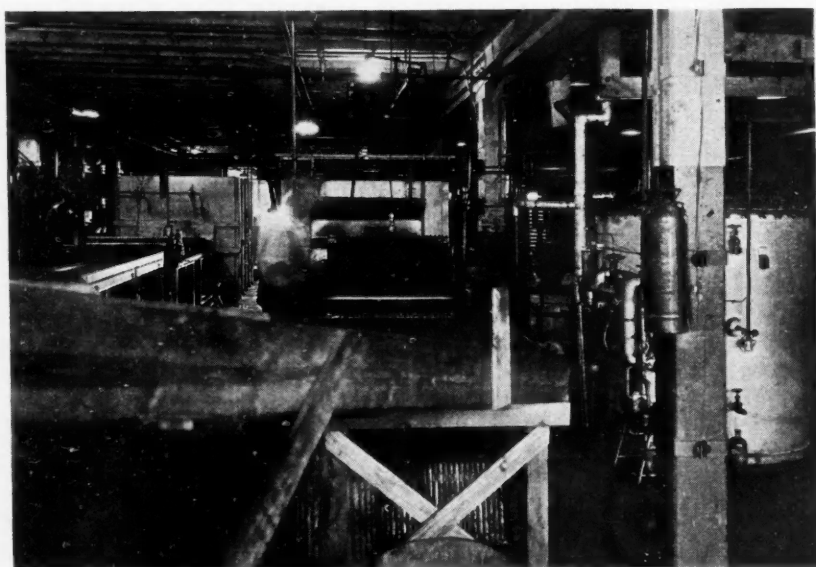


Fig. 1—General view of the furnace room at Bundy Tubing Co., Detroit, Michigan. Copper brazing furnaces on left and electrolene producer at right + + + + +

Controlled by Electrolene Producer

by H. M. Webber

Industrial Department
General Electric Co.

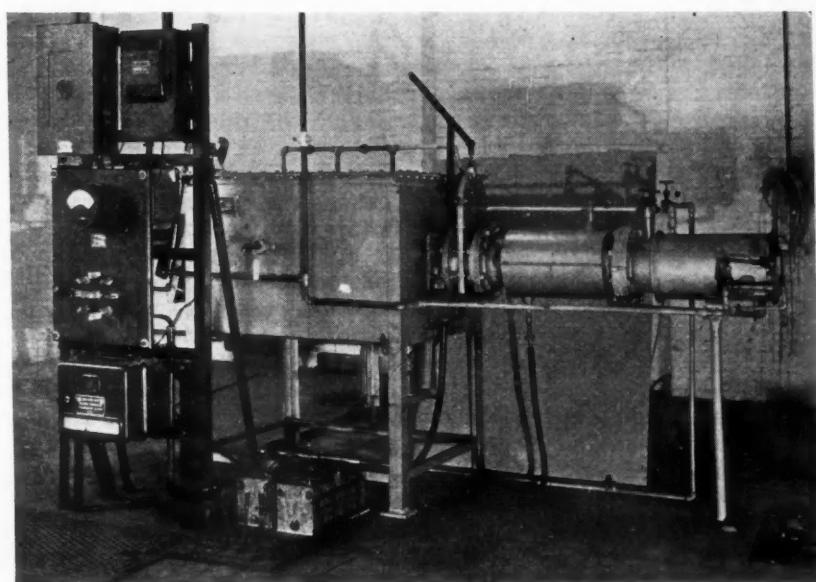


Fig. 2—Furnace with controlled atmospheres for copper brazing tungsten-carbide-alloy tools at Henry Disston & Sons, Inc., Philadelphia, Pa. + + + + +

to about 80 ft. are fed and discharged by driving rolls at each end of the furnace at a speed of approximately two feet per minute. The tube mills run at a speed of about 60 ft. per minute, and it is necessary to cut the tubing in lengths which can be handled around the shop. After the straight lengths come from the furnace, they are cut up and formed into specified shapes, or shipped in coils or short pieces as the occasion demands.

The furnace on the left is used for tubing up to $\frac{5}{8}$ in. O.D., and that on the right for sizes up to $\frac{3}{8}$ in. O.D. The furnaces are equipped with alloy tubes by means of which the steel tubing is supported and guided throughout the heating chamber.

The larger of the two copper brazing furnaces is rated 157 kw., 220 volts, 3-phase, 60 cycles, with the heating units divided into four temperature control zones throughout the chamber. Inside dimensions are approximately 4 ft. 3 in. wide by 7 ft. 2 in. long by 2 ft. 5 in. high. The cooling chamber is about 10 ft. long, and consists of individual tubes, one for each Bundyweld tube coming out of the furnace.



Fig. 3—Bell type copper brazing furnace for experimental purposes +

The smaller furnace is rated 123 kw., 220 volts, 3-phase, 60 cycles, with four temperature controls. Inside dimensions are approximately 3 ft. 8 in. wide by 6 ft. 8 in. long by 2 ft. 5 in. high. Each of the fur-

naces is equipped with nickel chromium ribbon resistors mounted on the side walls and floor.

The controlled atmosphere for the two furnaces is supplied by an electrolene producer shown at the extreme right in Fig. 1. This device is a modern development which has made copper brazing and other controlled atmosphere applications economically possible. The electrolene producer is an electric furnace equipped with a specially designed retort. Its operation consists of passing city gas and a controlled amount of steam through the chamber at approximately 2000 deg. F., during which time the hydrocarbons (methane and illuminants) dissociate into free hydrogen and carbon. The carbon instantly reacts with the steam liberating more free hydrogen and carbon monoxide. Hydrogen and carbon monoxide have excellent reducing properties, and the products of the reaction combined with hydrogen and carbon monoxide, originally carried in the city gas give a mixture containing a total of about 92 per cent of these two components. This reformed gas is called electrolene, and is used

throughout the heating and cooling chambers as protective atmospheres for the furnaces described above. Electrolene is made for approximately \$0.10 per hundred cu. ft.

Typical analyses of city gas and electrolene at the Bundy plant are as follows:

Components of City Gas (Per Cent)		Components of Electrolene (Per Cent)
3.5	CO ₂	.5
5.6	Illuminants	0.0
1.1	O ₂	.5
16.5	CO	25.
46.8	H ₂	67.
18.2	CH ₄ (Methane)	1.0
.3	C ₂ H ₆ (Ethane)	0.0
8.0	N ₂	6.0
100.0		100.0

The tips of practically all tungsten-carbide-alloy tools are copper brazed into their shanks. Henry Diss-ton and Sons, Inc., Philadelphia, Pa., has developed a very interesting line of inserted and solid-tooth disk saws, circular cutters, radius cutters, planer tool bits, etc., all of which are tipped with tungsten-carbide-alloy inserts. This new technique of tool making is, of course, being looked upon with interest.

An advantage of copper brazing the inserts in place, instead of welding is that checking or cracking of the bits during assembly is practically eliminated.

The procedure of copper brazing the tools is to fit the tungsten-carbide-alloy inserts into recesses in the cutters, with copper placed near the joints. The cutters are then loaded on small trays and charged into the furnace one tray at a time. After the charge is brazed, it is pushed on into the cooling chamber and replaced with a new charge in the heating chamber. When a sufficient time has elapsed, a tray is removed from the cooler through a door at the discharge end of the furnace, and the above cycle is then repeated.

The furnace used for this work is shown in Fig. 2. It is rated 10 kw., 220 volts, 1-phase, 60 cycles, and has working dimensions 6 in. wide by 4 in. high by 24 in. long. The cooling chamber is about double the length of the heater to provide an extra cooling period.

Between the heating and cooling chambers of this furnace are two doors, one of which is a fire clay

heat baffle to retain the heat within the furnace chamber. The other door is a gas-tight gate valve, adjacent to the heat baffle, within the cooling chamber. The function of this gas-tight door is to prevent the formation of circulating gas currents which might occur during the opening of one of the end doors, with a consequent inrush of air sufficient to oxidize the resistors. This inner door is, of course, kept closed as much as possible during the charging or discharging of work, but is opened along with the heat baffle when a tray is being pushed from the heater to the cooler.

Molybdenum wire resistors are mounted on the side walls and roof of this furnace wound sinusoidally on thin alundum slabs. These resistors supply direct radiant heat to the work, and have a reasonably long life for the service imposed on them. They are quite sensitive to oxidation at the copper brazing temperature, the oxide passing off into the atmosphere as a white vapor, never to be reclaimed. For this reason, it is necessary to resort to the precautions in furnace design described above.

A large automobile manufacturer, with a view of applying copper brazing in the fabrication of various parts of his product, is using the bell type copper brazing furnace shown in Fig. 3 for experimental work. The furnace is rated 65 kw., 110 volts, 3-phase, 60 cycles and has working dimensions 19 in. diameter by 32 in. high. The resistors are made of nickel chromium ribbon, mounted on the side walls. For charging, the furnace is raised up, a charge is mounted on the pedestal shown, and the furnace is then lowered onto the shot seal around the base. After a load has been heated and brazed, it is necessary to allow it to cool in the furnace to a temperature suitable for exposure of the work to the air. When lifting the furnace at elevated temperatures, with the chamber containing a protective atmosphere of hydrogen, a sheet of flame burns across the lower opening on the plane of contact between the hydrogen inside and the air outside.

Other manufacturers also are finding applications for copper brazing, with a resulting improvement in products at a lower manufacturing cost. The success of the application depends, of course, upon suitability of the design, and although it is not expected that every manufacturer will find use for it, there is no question but what many objects, now assembled by other methods, are or can be adapted for fabrication by the copper brazing process.

Steam Coils Heat Enameling Ovens

(Continued from page 677)

These ovens are heated indirectly, that is, air is heated in separate combustion chambers and forced into the ovens with fans.

A unique feature of these ovens is that the charging ends are heated with steam coils, while heat from the heaters is utilized in the remaining portions only. The reason for this is that too high a heat, applied just as the work comes out of the tanks, sets the japan before it has had a chance to drip and smooth out, leaving raised spots and streaks here and there.

The temperatures in the low heat and high heat sections of the ovens are automatically and separately controlled. The steam supplied by the gas fired boiler is maintained at a constant degree at the boiler. The correct temperature in the high heat portion of the oven is regulated by the amount of cold fresh air ad-

mitted into the recirculation system, and this in turn is controlled by a damper in the admitting flue. A temperature of 525 deg. F. is employed for baking on japan or enamel, and the baking period 1¾ hours.

The unit for japanning the wheels consists of a single dip tank and oven. Here the operator simply transfers the wheels from the conveyor from the unloading dock to the paint machines, where they are dipped and spun by centrifugal force, placed on the oven conveyor and are then automatically moved through the oven. The oven conveyor is similar to the one already described and is motor driven through a speed reduction mechanism.

The wheel oven is also indirectly heated with a separate heater 6 x 8 x 8 ft. high, and of the induced draft type, equipped with gas burners. Oven ventilation is furnished by means of a supply and an exhaust fan and a system of supply distribution and exhaust ducts, the fans being motor operated. The japan is baked on at 320 deg. F. for one hour and 20 minutes.

Serviceman Finds Joint at Roof Rail Weak Point in Car Body Construction

IN a talk on Body Design from the Serviceman's Viewpoint, given before the Detroit Section of the S.A.E., Ralph E. Bills pointed out that one of the weakest points in many bodies is the joint between the roof structure and the front pillars. In many cases where the joint between the roof rail and the pillar is by means of a bolt, the roof rail is so deeply countersunk for the washer and nut that very little material remains. When a car is brought to a stop by a sudden application of the brakes, this joint is subjected to heavy strain. Moreover, after the car has been in use for a year or so, the glue generally has disappeared entirely from this joint, and it is a frequent occurrence for the rail to break at this point in accidents.

Failure of this joint is also influenced by decay. In bodies in which the fabric comes down over the edge of the roof rail and is tacked down under the drip rail, the drip rail being of the type having a fabric filler to conceal the nails, the drip rails will loosen at the ends and the fabric will crack at about the place where the bolt joining the roof rail to the front pillar is located. Water will then get in, and decay of the roof rail will begin. In many cases the decay will extend to the windshield header. This will leave the front end of the body in a greatly weakened condition and necessitate an expensive repair.

There is room for considerable improvement of the seal of windshields at the edges. The rubber may have been designed to fit the opening, but owing to variations in production there may be more clearance at one end than at the other, with the result that the rubber will quickly crack or wear out, and the joint become defective. In one car it was noticed that while the windshield hit the filler strip at one end, it left a gap of more than $\frac{5}{8}$ in. at the other, with nothing but rubber to fill it.

French Roof is Improvement

The adoption of the French roof has been a great improvement in body design. It is a little more expensive to manufacture, but is much more serviceable and more beautiful. Some manufacturers use fabric filler in the molds around the roof coverings, which allows water to soak through to the framework, but to a much smaller extent than with the old style of construction. Even though many manufacturers having adopted the French style of roof are making the wooden framework much lighter, difficulties with the roof due to decay following leakage have been practically eliminated. The small wood parts at the edge of the roof that fit the curve underneath the roof panel and are drilled for screws are often found to be loose, the wood having broken when the screw was tightened up.

On these French roofs, it is often found that the solder cracks at the joints, where the roof panel is welded to the back panel, after the car has been in use for some time.

Wheel housings have been weak ever since closed

cars were first produced in large numbers, and it seems that whenever an attempt is made to cut manufacturing costs, a change to a thinner gage of metal for the wheel housing is made, or the number of rivets in the housing is decreased. Then, when the rear fender is bumped against some stationary object or against the fender of another car, it will crush slightly and put a large dent in the wheel housing. In many cases of this kind the metal at the lower corner will be cracked, particularly if the quarter panel and the wheel housing are not made in one stamping. It is a rather costly repair job to have the quarter panel and the rear fender "bumped out" and refinished, and the need for much of this repair work could be obviated by providing more reinforcement in the wheel housing, which would confine the damage to the fender.

Rear Windows Bother

Sometimes six months to a year after a car has left the factory a rear window will begin to leak. This generally is due to the fact that the material in which the glass is set is brittle and has cracked, thus allowing water to seep through. When fabric is used for the upper back panel, it is sometimes stretched so tightly around the corners of the rear window that the enamel is cracked while the fabric is being applied. This is not noticed by the plant inspectors, as the cracks become visible only after the car has been exposed to the weather for some time. Water will seep through these cracks and cause grief from decayed wood parts.

Doors are a cause of much trouble. In one particular car a double molding is used at the top of the doors, and the center pillar of the body, which is the lock pillar for both the front and rear doors, has no molding on it to fill in the space left by the double-molding. This allows rain and snow to enter through the door jambs.

There has been little change in the top part of the doors since closed cars were first built in quantity. As a rule, a panel of upholstering material is provided on the inside of the door opening to serve as a wind-breaker, together with a wind cord running down each pillar. Sometimes the panel of upholstering material across the top actually fits the door, but just as often it does not, and each winter the body repairman is called upon to make closer fits around the door to keep out drafts. At the bottom of the door the conditions are no better.

Wooden lock boards also give considerable trouble. So much of the board is cut away for fittings that little strength remains, and where remote control is used the bolts often pull through because insufficient reinforcement is provided. Troubles with doors are largely accounted for by the fact that too light metal is used in them and that the hinges project too far from the body. As a result of too light construction the doors sag and

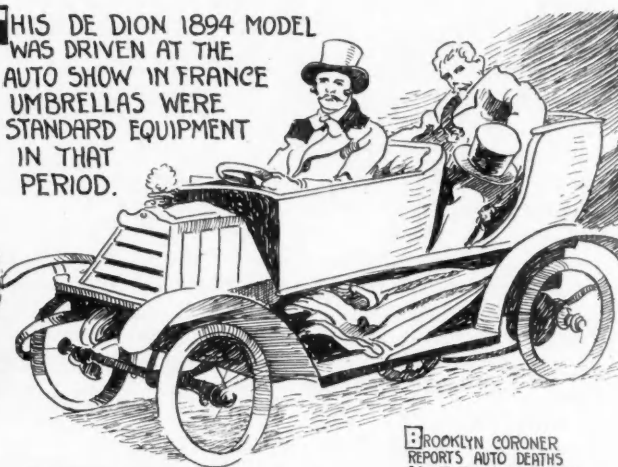
(Turn to page 708, please)

Automotive Oddities—By Pete Keenan



KING SOLOMON IS CREDITED WITH HAVING CONTRIVED A VEHICLE WHEREBY ONE COULD TRAVERSE THE AIR, (IN 974 B.C.)

THIS DE DION 1894 MODEL WAS DRIVEN AT THE AUTO SHOW IN FRANCE UMBRELLAS WERE STANDARD EQUIPMENT IN THAT PERIOD.



A. W. STUDYBAKER
IS A STUDEBAKER
DEALER IN
MIAMISBURG, OHIO.

BROOKLYN CORONER REPORTS AUTO DEATHS 4% OF THOSE CAUSED BY HORSES. (A BABY CARRIAGE EVEN CAUSED ONE DEATH) IN 1906.

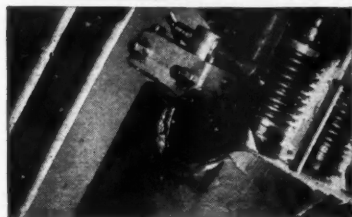


ON PRE-AUTOMOBILE DAYS GASOLINE WAS CARRIED OUT TO SEA AND DUMPED. REGARDED MERELY AS A BY-PRODUCT OF KEROSENE.



Do You Know
An "Oddity"?

Correspondence about "Automotive Oddities" is invited. Contributions used will receive editorial mention when practicable. If you are interested in the source of, or the reason for, a particular "Oddity," ask the editorial department of Automotive Industries about it.



NEWS

OF THE INDUSTRY



Lubricate Credits, Economists Urge

N. Y. Group Advocates
Freer Reserve Action

NEW YORK, Oct. 28 — The price declines of 1931 were not due so much to over-production, over-capacity, under-consumption, maladjustment of production, or gold shortage, as to central bank monetary policies and credit shortage, in the opinion of a number of leading economists discussing the price levels of the current year, at the meeting of the American Statistical Association, held at the Aldine Club, last evening.

The speakers included Prof. Irving Fisher of Yale University, Prof. E. W. Kemmerer of Princeton, Dr. Lionel D. Edie, economist and vice-president of the American Capital Corp., and Dr. Warren Persons, pinch-hitting for Carl Snyder, statistician for the Federal Reserve Bank of New York, who was unable to be present because of illness.

The crash of 1929 was due, according to Prof. Fisher, to an over-indebtedness brought on partly by reparations, inter-allied debts, industrial and municipal indebtedness in European countries and speculative debts in New York. Credits, Prof. Fisher pointed out, are debts. During the latter part of the period, between 1921 and 1929, debts were expanded to such a point that a slight jar caused the complete collapse, initiating the vicious circle of forced liquidation leading to lower prices which, in turn, forced more liquidations to cancel debts.

The gold supply has kept pace with the advance in industrial production so that there is no shortage of gold, Prof. Kemmerer pointed out. Both Prof. Kemmerer and Dr. Edie demonstrated the fact that the trouble today is that our gold supply is not being put to sufficient use. About one-tenth of the gold supply in the United States is re-

(Turn to page 702)

BACK at the turn of the century, an obscure "news-hound" was legging his way around Manhattan digging up stories for one of the world's largest news-reading audiences. Last Tuesday this reporter of yesteryear, now internationally famed as manager of the N.A.C.C., opened to the journalism classes at Columbia University modern journalism's vista of opportunity in service to industry. Perhaps no one could speak as fluently on trade association work as Mr. Reeves—no association seems to be as effective as is his.

Cord's representative at the N.A.C.C. Show Drawing sang out "B-4," punnishly appropriate for fore-end drive.

Thomas B. Doe is no proxy. As head of Eastern Air Transport he has done things. A 14 per cent to 25 per cent reduction in airline fares has just been announced, because passenger volume has shown a 300 per cent gain this year.

Evasion of gasoline taxes has become so serious a California oil company is advertising in daily newspapers offering rewards totaling \$20,000 for information leading to arrest and conviction of tax evaders.

When George F. Bauer, head of the N.A.C.C. export staff, returns from his business tour of the Far East, he is going to be surprised to see how his associates have hung Chinese and Japanese posters he forwarded to headquarters upside down and sideways.

Malicious bank rumors are not all: Adams Grease Gun Co. has been "rumored" out of business, although it is going strong.

While geographers are clambering their way over crags of dizzy mountain ranges and oceanographers are mapping deep dark valleys of the sea, Junkers is building a mystery aeroplane to discover some of the mysteries of the stratosphere. U. S. Consul H. L. Franklin of Leipzig has obtained only the sketchiest description: Extremely long fuselage, sharply pointed wings, slow speed at low altitude, but capable of 500 kilometers per hour in the rare altitudes in which it will seek its fame. All-metal cabin will be pressure-regulated, oxygen-supplied.

Walter Briggs, head of Briggs Mfg., has been named to the Detroit zoo commission. Are we going to get stamped animal crackers then, as depression pot boilers?

L. P.

THE
NEWS
TRAILER

Macauley Flays Excise Tax Idea

Calls Proposals Ill-
Advised at Present

DETROIT, Oct. 29—With reference to the proposed Federal Excise Tax on automobiles, Alvan Macauley, president of the Packard Motor Car Co. and N.A.C.C., issued a statement here today in which he charges that the proposals constitute an unwarranted discrimination against the country's 26,500,000 motor vehicle owners.

"Such a proposal," Mr. Macauley stated, "has been based on the utterly fallacious and discredited theory that motor vehicles still are luxuries. With ownership of automobiles concentrated, according to government statistics among farmers and wage earners in the lower income groups, it would be an injustice to impose additional burdens on them."

According to Mr. Macauley, the proposal is particularly ill advised coming at a time when the country is looking to the motor industry for leadership in the restoration of business stability.

The immediate effect of the Excise Tax proposed, he pointed out, would be to increase the price of the lowest priced car by \$40. It would increase the price of the average car by more than twice that amount.

Ford Installing Furnace

DETROIT, Oct. 29 — Installation of a 400-ton furnace, hot metal mixers and a baling press capable of making furnace "sandwiches" out of salvaged automobiles at the rate of almost one a minute is under way at the Rouge plant of Ford Motor. These additions involve an expenditure estimated at \$500,000 and will increase the melting facilities of the open-hearth equipment by 600 tons, bringing the total capacity to approximately 2600 tons every 24 hours.

Pierce-Arrow Splits Sales Territories With Managers in New York and Chicago



WILLOUGHBY
EAST FOR PIERCE

Pierce-Arrow Motor Car Co. announces a new sales structure, which brings sales leadership into the heart of retail selling areas by dividing the country into two major divisions—the Western and the Eastern—under the respective administrations of Geo. E. Willis, at Chicago, and D. J. Willoughby, in New York.



WILLIS
WEST FOR PIERCE

Autocar Opens New Branch

NEWARK, N. J., Oct. 26—The Newark factory branch of the Autocar Co. has taken possession of the new building which was erected for its exclusive occupancy at Jefferson and Malvern Streets where it is believed that the better location, combined with increased equipment and facilities will adequately care for the increasing sales and service demands of Autocar trucks in that territory.

W. H. Moore has recently been appointed manager of the Autocar Branch in Newark. He was formerly assistant district manager of the Autocar sales territory in the metropolitan New York district, and before that was a prominent member of the branch organization of the White Co. by whom he was at one time previously stationed in Newark.

Mails Show Invitations to Foreign Officials

NEW YORK, Oct. 26—National Automobile Chamber of Commerce has mailed invitations to 3500 foreign highway officials, automobile dealers and others prominent in the automotive industry to participate in the International Day program to be held Jan. 11 in connection with the New York show.

Inspection of exhibits at the show will follow a program of addresses by domestic and foreign leaders in the industry. Foreign visitors are also being invited to attend the annual show banquet at the Commodore Hotel, Tuesday evening, Jan. 12.

Great Lakes Gets Receiver

DETROIT, Oct. 26—Following the failure at the annual stockholders' meeting, Oct. 21, to secure sufficient proxies for a quorum to vote on the proposed reorganization plans of Detroit Aircraft, this corporation has secured from Federal Court the appointment of Peter R. Beasley and the Detroit Trust Co. as receivers. In the petition assets were given at \$2,207,226 and liabilities at \$203,915. The next stockholders' meeting will be

Nov. 4 and if stockholders cooperate at this time on the corporation's move to split into two divisions, one for lighter than air and one for heavier than air, it is believed the receivership may be discharged at an early date.

Joseph Bijur

Joseph Bijur, who had been connected with the automobile industry for a long time as manufacturer of accessories, died by his own hand in Long Island City, N. Y., on Oct. 19. He was a graduate of Columbia University and of Columbia School of Mines, and he entered the electrical industry at an early age.

In 1910, when electrical equipment for automotive lighting and engine starting began to be installed on passenger cars, he organized the Bijur Motor Lighting Company of New York. Mr. Bijur was an inventor and engineer of no mean ability and did particularly noteworthy work in connection with the development of electric starters. The system manufactured by his firm was standard equipment on cars of leading makes for a number of years.

The Bijur Motor Lighting Co. was later taken over by the General Electric Co., and Bijur then developed a system of centralized chassis lubrication which has since found wide application both here and in Europe. Mr. Bijur was a member of the Society of Automotive Engineers and of its Metropolitan Section, and he was a rather regular attendant at its annual and summer meetings, until in recent years, when he suffered from ill health.

Briggs & Stratton Profits

NEW YORK, Oct. 26—Briggs & Stratton Corp. reports net profits for the nine months ended Sept. 30 of \$328,493 or \$1.09 a share on capital stock. This compares with \$822,466 or \$2.74 a share for the corresponding period of last year.

Earnings for the September quarter were \$8,451 or 3 cents a share, as compared with \$199,621 or 67 cents a share a year ago.

A. R. Sandt Joins N. S. P. A. Staff

A. R. (Ralph) Sandt has been appointed Director of Market Development of the National Standard Parts Association.

For the past eight years Mr. Sandt has been engaged in marketing research work in the interest of the parts and service departments of the many subsidiaries and divisions of General Motors Corp.

His entrance into the automotive industry was made in 1908 via the "grease ball" route in an independent garage. During two years in the U. S. Army his work was of an automotive engineering nature.

For seven years prior to his connection with General Motors, Mr. Sandt was engaged in consulting engineering which included the design and manufacture of cars, trucks and tractors, as well as the development



of merchandising plans for the products involved.

He is a past-president of Detroit Boosters No. 19, of which organization he was recently elected treasurer for the ensuing year. Mr. Sandt will take up his work with the National Standard parts Association on Nov. 1.

Delage to Build Rolls-Royce Aero Engine

PARIS, Oct. 21 (by mail)—Delage, the French automobile manufacturer, is reported to have secured manufacturing rights for the Rolls-Royce Model R aircraft engine. The terms under which the license was issued are said to include a payment of between three and four million francs for the working blueprints, an order for between five and six million reserve parts, and a royalty of 15,000 francs (\$590) for each engine built.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, Oct. 28—While there was no definite improvement in the trend of business last week, the business morale of the country was more cheerful. Among the factors contributing to this better feeling are the comparative steadiness of commodity prices, the firmness of bond prices, and the strength with which security prices have recovered after reactions.

INDUSTRIAL EMPLOYMENT

Employment in 15 major industrial groups during September, according to the Bureau of Labor Statistics, increased 0.8 per cent above the August level, while total payrolls decreased 2.8 per cent. Part of the decrease in payrolls is accounted for by the Labor Day holiday in September.

LIFE INSURANCE SALES

Sales of ordinary life insurance during September continued the upward trend of the preceding month. The total for September was only 11 per cent below that a year ago, while the total for the first nine months of this year was 16 per cent below that in the corresponding period last year. Sales of ordinary life insurance in New York City during September were only 6 per cent below those a year ago.

FARM WAGES

The index of farm wages on Oct. 1, according to the Bureau of Agricultural Economics, was 113, based on the 1910-14 average as 100, as against 150 a year ago. Farm wages on Oct. 1 were the lowest in fifteen years.

MERCHANDISE EXPORTS

Merchandise exports during September totaled \$181,000,000, as against \$164,817,000 during August and \$312,207,000 a year ago. Imports amounted to \$171,000,000, as against \$166,670,000 during the preceding month and \$226,352,000 a year ago.

CAR LOADINGS

Railway freight loadings during the week ended Oct. 10 totaled 763,864 cars, which marks a decrease of 13,973 cars below those during the preceding week, a decrease of 190,918 cars below those a year ago, and a decrease of 415,676 cars below those two years ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Oct. 24 stood at 68.5, as against 68.2 the week before and 68.1 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended Oct. 21 were 25 per cent below those a year ago.

STOCK MARKET

After a downward movement during the preceding week, the stock market at the beginning of last week advanced. However, the failure of the Interstate Commerce Commission to grant fully the railways' request for a 15 per cent increase in rates had a depressing influence on prices, particularly those of railway shares. The gains of most issues in the earlier part of the week more than offset the subsequent declines, but the railroad stocks suffered sharp net losses.

RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended Oct. 21 showed increases of \$70,000,000 in holdings of discounted bills and of \$39,000,000 in holdings of bills bought in the open market. Holdings of Government securities remained unchanged. The reserve ratio on Oct. 21 was 59.9 per cent, as against 61.8 per cent a week earlier and 67.1 per cent two weeks earlier.

Chrysler Earns 85 cents

NEW YORK, Oct. 26—Chrysler Corp. and subsidiaries report consolidated net profit for the first three quarters of this year of \$3,771,002. This is equivalent to 85 cents a share on capital stock, and compares with \$2,492,747 or 56 cents for the corresponding period of 1930.

Earnings for the September quarter were \$1,518,966 or 34 cents a share, as compared with net loss of \$916,108 for the corresponding quarter of last year.

A quarterly dividend of 25 cents a share has been declared, payable Jan. 4 to stockholders of record Dec. 1.

Air Services May Carry 400,000 Persons in 1931

NEW YORK, Oct. 26—Commercial air services will carry more than 400,000 persons this year, according to the Aeronautical Chamber of Commerce, of America, Inc. This compares with 385,910 passengers carried last year. During August of this year, these lines carried 54,163 persons, an increase of 17 per cent over August of last year. This is the third consecutive month this year in which passenger carriage has exceeded the corresponding month of last year.

Caterpillar Reports Profit

NEW YORK, Oct. 26—Caterpillar Tractor Co. reports net earnings for the nine months ended Sept. 30 of \$1,629,481. This is equivalent to 87 cents a share and compares with earnings of \$6,137,301, or \$3.26 a share for the corresponding period a year ago. Earnings for the third quarter were \$183,006 or 10 cents a share, as compared with \$514,336 or 27 cents a share for the corresponding period of last year.

A dividend of 50 cents was declared, payable Nov. 30 to stockholders of record Nov. 14.

Exide to Build in Canada

MONTREAL, Oct. 24—Plans have been completed for a Montreal factory and offices of the Exide Batteries of Canada, Limited, on St. Remi Street, near the Canadian National Tracks, and tenders will be called.

Three-quarter rear view of the new Auburn Speedster model announced this week. It is built on the regular Auburn 127-inch wheelbase chassis, powered by 98 hp. Lycoming straight-eight engine. Among its features are: Silent and constant mesh gears, free wheeling, automatic Bijur lubrication, X-type cross member frame

Parts Index Takes a Drop

But Items for Service Nearly Equal Last Year

NEW YORK, Oct. 27—Parts and accessories manufacturers showed a seasonal decline during September, according to the monthly index figures of the Motor and Equipment Association. The grand index for the industry as a whole for the month was 67 based on January, 1925, as 100, which compares with an index of 79 for the previous month and with 89 for the month of September, 1930. All groups with the exception of service parts contributed to this decline. That group, however, showed an advance over the previous month and nearly equaled the corresponding month of last year. The index for service parts was 138, as compared with 127 in August and 139 in September last year.

Original equipment, due to the reduced car production schedule for October, showed a decline to 54, as compared with 70 in August and with 79 in September, 1930. Accessories were fairly steady at 66, which was also the index for August and which compares with 76 for the month of September last year. The service equipment index for the month was 67 as against 80 in August and 105 in September, 1930.

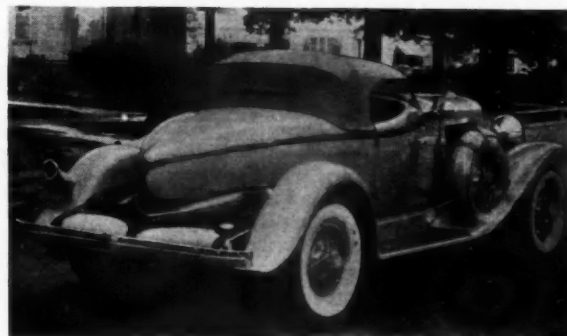
Indian Reports Loss

NEW YORK, Oct. 27—Indian Motorcycle Co. reports a net loss for the nine months ending Sept. 30 of \$73,187, after all charges including depreciation. This compares with a loss of \$492,599 for the same period last year. The loss for the three quarters is \$44,763, as compared with a profit of \$30,206 for the June 1 quarter.

Welding Suit Decided

MILWAUKEE, Oct. 26—A decree has been entered in Federal Court here upholding the A. O. Smith Corp. in its defense against the Morton automatic welding patents.

Auburn Returns to Early Love



Borg-Warner Earns 88 Cents a Share

Net Total For
Third Quarter
Reaches \$182,428

CHICAGO, Oct. 26—For the nine months ended Sept. 30, Borg-Warner Corp. reports net profit after all charges, including Federal taxes, of \$1,267,274, as compared with \$2,574,186 for the first nine months of 1930. Net income was equivalent, after preferred dividends, to 88 cents a share on 1,209,653 common against \$1.93 last year.

Net for the quarter ended Sept. 30 totaled \$182,428, after all charges including Federal taxes and depreciation and interest, compared with \$198,860 in the 1930 period. Comparative per share results on the common after preferred dividends were 10 cents a share in the 1931 quarter and 11 cents in 1930.

Total current assets Sept. 30 were \$16,482,350. Holdings of cash, call loans and marketable securities increased from \$7,198,353 Dec. 31, 1930, to \$8,935,186 Sept. 30, a gain of \$1,736,833. Liquid current asset items had a ratio of 2.73 to 1 with total current liabilities. Since Jan. 1 the company reports reduction of \$49,000 in outstanding debenture bonds of Morse Chain Co., a subsidiary, and retirement of the entire \$110,000 issue of real estate mortgage bonds of the Long Manufacturing Co. Book value of Borg-Warner common, as of Sept. 30, was \$22.63 a share.

N.E.L.A. Maps Program For Vehicle Study

WASHINGTON, Oct. 26—The Motor Transportation Committee of the National Electric Light Association meeting here today for organization mapped out a program of study of five subjects in its field. The subjects and committee chairmen are: Supervision, G. F. McClellan, New York; technical, E. L. Tirrell, New York; maintenance, L. V. Newton, Chicago; vehicles, E. J. Graham, Denver, Colo.; cost systems, J. E. Orr, Pittsburgh.

A. H. Gossard, Middle West Utilities, Chicago, general chairman of the national committee, outlined the subdivisions of work of each committee. The next meeting will be held in Chicago early in the new year on call of the chairman.

Auto-Lite Profits

NEW YORK, Oct. 27—Electric Auto-Lite Co. and subsidiaries report net profit for the first nine months of the current year of \$3,741,074. This is equivalent to \$2.95 a share on common stock and compares with earnings of \$5,456,459 during the corresponding period a year ago.

Pierce Reports Profit

NEW YORK, Oct. 27—Pierce-Arrow Motor Co. and subsidiaries report a net profit for the first nine months of the current year of \$226,435 or \$3.16 a share on 6 per cent preferred stock. This compares with net profit of \$1,308,748 for the corresponding period a year ago. For the third quarter this company shows a loss of \$190,377 after all charges. This compares with a net profit of \$278,070 for the corresponding quarter of last year.

Fenglar Plans Car For World Speed Mark

LOS ANGELES, Oct. 26—Harlan Fenglar, one-time race driver, dirt track race promoter, and more recently manager of an automotive special manufacturing company, has severed all business connections to devote his energies to raising funds for building America I, a 3000 hp. super-racer with which Fenglar hopes to retrieve the world's speed record now held by an Englishman.

The unusual feature of Fenglar's plans is that he seeks to finance the construction of the \$75,000 Juggernaut by public subscription. He is mailing a circular with inclosed subscription cards asking \$1.00 subscriptions, giving as receipt a stamped metal replica of the America I.

America I has been designed by Fenglar and a wind tunnel scale model constructed. The machine will have two engines, each to be of 1500 hp. One engine will drive each set of wheels and will be placed front and rear with cockpit between. The motors would not be connected. Length of the car will be 24 ft., greatest height five feet six inches and main body height three feet.

Fenglar is of the opinion America I will be capable of 300 miles per hour, 54 miles an hour faster than the present world record of Malcolm Campbell. The car's construction is planned in one of the smaller suburbs near Los Angeles with test runs to be made on one of the dry lakes. The actual world record attempt would be made at Daytona Beach, probably not sooner than a year from now.

Here shown Harlan Fenglar seems to have a far-away look in his eyes. The streamlined gadget is a model of America I with which he hopes to lift the world's record for land speed + + +



Austin Offers Free Motoring in Sales Drive

PITTSBURGH, Oct. 27—New purchasers of Austin Bantam cars will receive free oil, gasoline, tire repairs, replacements, and general maintenance on the car for a period of one year from date of purchase, or until 7500 miles have elapsed on the life of the car, according to Russell K. Jones, vice-president of the American Austin Car Co., Butler, Pa. The plan is being announced through newspaper advertising in the cities of Philadelphia, Pittsburgh and Butler, Pa., and for the present its operations will be restricted to three cities mentioned.

Under the plan each purchaser of a new Austin gets a coupon book which entitles him to gasoline and oil at any authorized station of the Gulf Refining Co. The purchaser agrees to take his car to an authorized Austin service station for a periodical inspection at 500 miles, 1000 miles, 1500 miles, and each thousand thereafter until 7500 miles or one year have elapsed.

The new plan is sold under a specific two-party agreement obligating both the company and the purchaser. Special merchandising is planned.

Implement Makers Elect

CHICAGO, Oct. 26—Election of officers closed sessions of manufacturers and dealers in farm equipment held in Chicago last week. The following officers were elected by the National Association of Farm Equipment Manufacturers: Daniel Seltzer, president, Ohio Cultivator Co., to succeed H. G. Newcomer of Utica, N. Y., as president; Charles D. Williams, president, Deere & Co., Moline, Ill., chairman of the executive committee. The National Federation of Implement Dealers Associations elected N. G. Bonder, Sutton, Neb., president.

Kelly Gets Operating Profit

NEW YORK, Oct. 27—Kelly-Springfield Tire Co. reports operating profits before depreciation and other charges for the September quarter of the current year of \$399,082 or a net profit after these charges of \$214,662.

Exports, Imports and Reimports of the Automotive Industry For September and Nine Months Ended September, 1931-30

	Month of September		1930		Nine Months Ended September		1930	
	Number	Value	Number	Value	Number	Value	Number	Value
Automobiles, parts and accessories.....		\$8,658,046		\$16,421,262		\$124,731,780		\$233,511,346
*Electric trucks and passenger cars.....							30	64,247
Motor trucks and buses except elec. (total).....	4,171	1,917,713	5,312	3,447,121	39,213	20,788,367	69,722	46,602,789
**Under one ton.....	375	109,617	1,990	962,474	5,973	2,055,768	27,243	14,544,345
**One and up to 1½ tons.....	3,397	1,342,278			28,520	12,624,679		
**Over 1½ tons to 2½ tons.....	209	208,889	3,055	1,868,491	3,137	3,666,355	38,981	24,844,924
**Over 2½ tons.....	117	195,440	267	616,156	1,205	2,162,602	3,498	7,213,520
PASSENGER CARS								
Passenger cars except electric (total).....	4,577	2,926,904	8,130	5,594,788	71,593	44,023,969	130,798	91,272,904
Low price range, \$850 inclusive.....	3,610	1,814,617	5,942	2,886,775	56,953	27,476,630	94,786	47,864,384
**Medium price range, over \$850 to \$1,200.....	535	523,604			9,044	8,688,599		
**\$1,200 to \$2,000.....	189	265,679	1,863	1,921,887	2,524	3,637,096	31,541	32,708,229
**Over \$2,000.....	98	256,728	320	781,526	1,372	3,497,054	4,466	10,694,810
PARTS, ETC.								
Parts, except engines and tires.....								
Automobile unit assemblies.....		1,582,582		3,893,378		33,932,504		51,149,783
Automobile parts for replacement (n.e.s.).....		1,867,069		2,907,799		20,880,400		33,999,790
Automobile accessories.....		195,758		369,021		2,651,694		4,493,299
Automobile service appliances (n.e.s.).....		549,829		384,774		3,307,350		5,089,106
Trailers.....	26	7,727	68	26,178	573	195,950	1,155	531,774
Airplanes, seaplanes and other aircraft.....	11	165,837	14	187,219	112	1,620,404	251	3,740,082
Parts of airplanes, except engines and tires.....		88,589		208,768		1,358,587		1,753,698
BICYCLES, ETC.								
Bicycles.....	71	1,548	328	8,765	1,190	30,126	3,152	84,582
Motorcycles.....	228	54,514	355	86,450	4,964	1,190,928	9,295	2,166,047
Parts and accessories, except tires.....		40,963		52,856		478,935		811,271
INTERNAL COMBUSTION ENGINES								
Stationary and Portable								
Diesel and Semi-Diesel.....	1	2,227	25	66,518	247	244,122	236	738,521
Other stationary and portable:								
Not over 10 hp.....	415	30,063	2,513	161,035	6,382	496,926	21,314	1,589,533
Over 10 hp.....	102	80,491	80	64,613	3,695	1,797,359	3,899	2,148,222
Automobile engines for:								
Motor trucks and buses.....	371	43,453	18	8,168	5,006	716,424	19,065	1,574,463
Passenger cars.....	1,437	86,088	1,555	151,437	16,851	1,320,637	38,657	3,749,493
Tractors.....	2	1,023	4	1,273	23	6,115	256	101,447
Aircraft.....	28	98,559	41	172,416	240	1,132,222	294	1,289,343
Accessories and parts (carburetors).....		142,510		260,814		1,766,776		2,770,183
IMPORTS								
Automobiles and chassis (dutiable).....	76	141,619	88	104,267	510	641,709	462	784,288
Other vehicles and parts for them (dutiable).....		4,815		7,448		58,801		339,729
REIMPORTS								
Automobiles (free from duty).....	41	45,486	41	38,021	195	156,857	240	231,819

*Not shown separately after 1930.

**Classification changes beginning January, 1931.

Natural Gasoline Production Declines

The trend of natural gasoline production, consistently upward since its beginning, showed a marked reversal in 1930, when the output failed to surpass the 1929 total. The production in 1930 amounted to 2,210,494,000 gal. as compared with 2,233,688,000 gal. in 1929, a decrease of 1.0 per cent, according to the United States Bureau of Mines, Department of Commerce. In spite of this decline, the United States still ranks far ahead of the other nations in natural gasoline production. In 1929, the latest year for which complete world figures now are available, the United States produced 91 per cent of the world total. However, the proportion produced by the other countries, while small, has grown steadily.

Packard Reports Profit

DETROIT, Oct. 27—Packard Motor Car Co., has reported net profit of \$104,200 for quarter ended Sept. 30, 1931, compared with net profit of \$1,153,771 in the third quarter last year. Net profit for the first nine months of 1931 was \$14,080.

To Try Pick-Up Service

CHICAGO, Oct. 26—Pickup and delivery service will be provided at an early date by the Illinois Central Railroad between Chicago and Kankakee under an arrangement which has just

been entered into by the railroad and district truckers. The move is in the nature of an experiment and is the fourth of its kind to be inaugurated. Similar service is now in effect in the New Orleans district, Memphis-St. Louis territory and the territory north of Memphis.

Introduces New Finishes

DETROIT, Oct. 28—E. I. duPont de Nemours & Co. has recently introduced a new finish called "Dulux" for use on fenders, wheels, etc. Exceptional resistance to weathering and abrasive action is claimed for the new finish. There is also available an improved grade of Duco for body finishing. The vehicle carries a higher solid content, and is said to have a higher initial lustre than that now in use.

Stewart-Warner Reports Loss

CHICAGO, Oct. 27—Stewart-Warner Corp. and subsidiaries report for the quarter ended Sept. 30, a net loss of \$791,496, after all charges, against net profit of \$110,937 or 8 cents a share, earned on 1,295,882 capital stock in the June quarter and net profit of \$454,587 or 35 cents a share for the quarter ended Sept. 30, 1930. For the nine months just ended, net loss was \$1,012,315, compared with a net profit of \$1,983,450 or \$1.53 a share in the corresponding period last year.

Federal to Retire Notes

DETROIT, Oct. 27—On Nov. 1, 1931, Federal Motor Truck Co. will retire the balance of its outstanding serial 5 per cent gold debenture notes amounting to \$625,000, which mature on that date. The original issue dated Nov. 1, 1925, totaled \$1,500,000.

The company states that following the retirement of these debenture notes there are no other outstanding bonds or notes ahead of common stock, and that the cash position of the company after the payment amounts approximately to \$1,000,000 in cash and marketable securities. Union Guardian Trust Co., Detroit, are handling the retirement of the above issue.

Buick Begins Campaign

DETROIT, Oct. 31—Twenty-four sheet posters will appear tomorrow announcing the "Wizard Control" to be found on the 1932 Buicks to create interest in the new car, announcement expected shortly. An unusually extensive radio campaign both before and following the announcement has also been worked out.

Knudsen Returns to U. S.

NEW YORK, Oct. 29—William Knudsen, president of the Chevrolet Motor Car Co., returned today aboard the Europa from a brief trip to Europe. This trip was largely personal, as Mr. Knudsen visited his mother while abroad.

Men of the Industry and What They Are Doing

Dodge Promotes Purves

W. M. Purves, formerly passenger car sales manager for Dodge Brothers Corp., has been appointed assistant general sales manager.

His duties have been extended to sales activities of passenger cars, trucks, school buses, taxicabs, parts and service and advertising and promotional endeavor.

Mr. Purves' first position after leaving Princeton University in 1907, was that of mechanic in Orillia, Ont. Joining the Ford Motor Co. in 1913 he served in various capacities until the entry of the United States into the World War when he was given a leave of absence to become a member of the government's executive committee of five men operating the Gas Defense Plants in New York.

Rejoining the Ford organization at the close of the War, Mr. Purves served until the fall of 1919, when he left to become assistant general sales manager of the Wills Ste. Claire Co. From there he went to the Gray Motor Co. as general sales manager.

Mr. Purves' first connection with Dodge Brothers was in 1924 when he joined the field organization as a district manager. He served in that capacity in Detroit and Dallas, later being promoted to regional manager at Chicago, from whence he was called back to Detroit to become passenger car sales manager, in which position he has served for the past five years.

Glazebrook Heads National

National Aviation Corp. has elected Otis A. Glazebrook, Jr., of G. M.-P. Murphy & Co., as chairman of the board, succeeding C. M. Keys, resigned.

New members of the board of directors elected at the meeting last week were: David K. Bruce, M. C. Cooper, Cornelius Vanderbilt Whitney.

Claypool Retires, I.H.C. Promotes Kruse

C. A. Claypool, branch manager in Ft. Dodge, Iowa, for the International Harvester Co., with which he has been associated 35 years, has retired. H. C. Kruse, for many years assistant manager in Ft. Dodge, has been advanced to manager of the branch.

Banigan is Honored

Leon F. Banigan, editor of *Motor World Wholesale*, was awarded honorable mention by the Associated Business Publications, Inc., for an editorial which appeared in the November, 1930, issue of that publication.

The editorial was entered in the an-

nual contest in which more than 100 publications submitted editorial material. *Motor World Wholesale* is a Chilton Class Journal Co. publication.

Menzel Joins Graham

Steven J. Menzel has joined the engineering department of the Graham-Paige Motors Corp. as stamping engineer. For a year and a half he was sales manager of the stamping division of Briggs Mfg. Co., previous to which he was sales manager for Mullins Mfg. Co., Salem, Ohio, with whom he served eight years.

E. D. Bottom Promoted

Earle D. Bottom, formerly wholesale manager at the Ford Motor Co., Norfolk (Va.) plant, has been appointed assistant manager of the Ford branch in Atlanta, Ga.

Heath to Join Smith Corp.

W. C. Heath, vice-president of Fairbanks, Morse & Co., Beloit, Wis., in charge of manufacturing, has resigned to become associated on Nov. 1 with the A. O. Smith Corp., Milwaukee. His new duties and title have not been announced. Mr. Heath joined Fairbanks-Morse in May, 1909, as a member of the engineering staff of the main works at Beloit. In 1915 he was placed in charge of standardization methods. Two years later he was appointed superintendent of the pump department and in 1918 superintendent of the small engine division. Early in 1919 he became assistant general superintendent of the Beloit works and shortly afterward was named general superintendent. In 1920 he was appointed general manager. Five years later all other plants, at Three Rivers, Mich., and Indianapolis, were brought under his management, and in May, 1927, he was elected vice-president.

Rumely Makes Shift

MILWAUKEE, Oct. 26—Following the consolidation of the Advance-Rumely Thresher Co. and the removal of headquarters for track type and industrial tractor sales from Springfield, Ill., to the main works of the Allis-Chalmers Mfg. Co. here, H. C. Merritt, general manager of the tractor division, has announced a number of changes in the sales department. W. A. Roberts, formerly agricultural sales manager, has been named general sales manager. H. J. Yoakum, formerly industrial sales manager, is now in direct charge of track type and industrial sales.

W. J. Weldon, for 12 years assistant and advertising manager of Advance-Rumely, has been appointed advertising manager of the Allis-Chalmers tractor division.

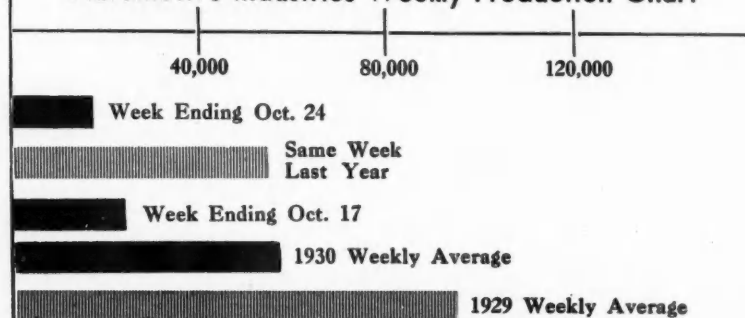
Lefebvre Forms Company

Gordon Lefebvre, formerly vice-president in charge of operations of the Oakland Motor Car Co., heads the recently organized engineering firm of Gordon Lefebvre & Co., which will act in a consultant capacity on problems of production cost, merchandising, building, machine design, etc. Harrison J. Stringham, formerly vice-president of William L. Davis & Co., investment banker, will be associated with Mr. Lefebvre in the new undertaking.

Sears Adds Accident Insurance Coverage

CHICAGO, Oct. 26—Automobile accident insurance has been added to the lines of the Allstate Insurance Co., division of Sears, Roebuck & Co., G. E. Humphrey, president of the subsidiary, has announced. The new line includes two policies, one provides for a principal sum of \$1,500 or \$25 weekly indemnity, and the other for a principal sum of \$5,000 or \$25 weekly. The rates are reported to be 20 per cent under manual rates for the same insurance in stock companies. With the organization of the company six months ago it was announced automobile insurance would be written 20 per cent below manual rates.

Automotive Industries Weekly Production Chart



Treasury Proposes, A.A.A. Opposes New Move For Excise Tax on Automobile Sales

By L. W. MOFFETT

WASHINGTON, Oct. 27—The American Automobile Association has served notice that it will strongly oppose the Treasury Department plan to levy an excise tax on automobiles. The statement made last week at the Treasury that motor vehicles are among the products included in its so-called "selective list" for restoration of excise taxes in an effort to balance the budget, prompted a protest from the association that "no American industry has been harder hit by the depression" than the automotive industry, and that "Treasury intimations" that automobile taxes are nominal are based on "false assumptions."

The association statement said that the motor vehicle already pays in taxes 18.3 per cent per annum of its valuation, bears "a very large share" of road costs and has "contributed more than a billion dollars in the form of excise taxes, which practically balance the total outlay in Federal (highway) aid to date."

The Treasury position is not a mere "intimation." It has made it definitely known that it will recommend restoration of excise taxes on motor vehicles. This would be one item of its so-called selective list so far studied by experts in the Department. Other products now included in the selective list are radios, and perhaps cigarettes. These are held to be possible sources for bringing additional revenue, but the list has not been completed. When it is it will go to the White House for study, after which it would be sent to Congress. It is said the Treasury has definitely decided not to levy taxes on articles of food, rent, fuel or other necessities.

The Treasury is aware, however, that any attempt to restore excise taxes on motor vehicles will meet with vigorous protest and that even greater

protest will be made against any form of sales taxes. By many it is doubted that Congress will accept such a program. Senator Reed of Pennsylvania, a member of the Committee on Finance, which passes on revenue raising measures, has proposed a general sales tax covering all commodities sold at retail. His proposal met with a storm of protests throughout the country. Representative Bacharach, a member of the House Committee on Ways and Means, which initiates revenue legislation for the House, has proposed a sales tax on "luxuries" without indicating what he meant by the term.

Among important organizations which have announced they will oppose sales taxes of any and all kinds is the American Federation of Labor. Different organizations in the automotive trade have also from time to time expressed pronounced views in opposition to sales taxes on motor vehicles, and are making efforts to block such a move.

It was over the opposition of Secretary of the Treasury Mellon that excise taxes on motor vehicles were eliminated in the 1926 revenue act. Treasury experts, however, appear to hold to the view that these taxes should be restored. One outstanding contention made by them is that motor vehicles use roads built by the Federal government and states and pay only a nominal license fee and a gasoline tax. On the other hand, they maintain that the railroads are taxed, and that since one form of transportation is taxed the other form should be subjected to like taxation. It is the idea of those proposing motor vehicle sales taxes that they would be absorbed by the manufacturers and not be passed on to consumers, though this is contrary to experience under the previous motor vehicle sales tax.

resigning from Vickers, Ltd., in 1923 he had spent most of his time in New York and Florida.

Florida Gas Sales Up

TALLAHASSEE, FLA., Oct. 28—Gasoline tax collections for the month of September totaled \$1,151,327.10, according to figures given out by the comptroller's office. This represents an increase of \$56,294.77 over collections for the month of August.

Watson is Honored

TORONTO, ONT., Oct. 26—Charles S. Watson, advertising manager of Goodyear Tire and Rubber Company of Canada, Limited, was elected first vice-president of the Direct Mail Advertisers Association at its annual convention which was held recently in Buffalo.

Automotive Steel In Wider Demand

Price Concessions Reported as Market is More Cheerful

NEW YORK, Oct. 29—The more cheerful tone of the steel market and somewhat broader automotive demand are accompanied by a recrudescence of keener than keen competition among producers, especially in the Detroit market. Concessions of \$1 per ton are reported to have been made on soft steel bars and hot-rolled strip steel, with cold rolled quoted at 2.15 cents, Pittsburgh or Cleveland, as compared with 2.25 cents for routine tonnages a few weeks ago, a cut of \$2 per ton. Sheet prices are quatably unchanged, but prices all along the line are under the influence of the scramble of sellers for all the business in sight.

It is estimated that, if the higher freight rates granted to the railroads by the Interstate Commerce Commission under the pooling plan are finally accepted by the carriers, approximately 65 cents will be added to the cost of each ton of finished steel. Economies resulting from wage and salary cuts will be more than offset by this increase in costs. This, of course, should impart an element of firmness to prices, but this for the time being is lacking.

The leading manufacturers of low-priced passenger cars have covered most of their November requirements. Steel producers have been trying to get a line on the outlook for automotive buying during the first quarter of 1932, and have learned that one of the factors they must take into consideration is that the program of motor car manufacturers aims at providing as much employment as possible during those months in which otherwise the greatest hardship would result. With the steel industry actuated by the same desire, a dovetailing of operating schedules of automotive consumers and finishing mills is likely to eliminate anything like a spectacular bulge in the operating rate of steel mills and make for as much spreading out of orders over the winter as possible.

Pig Iron—While Middle West inquiries for first quarter 1932 deliveries from automotive foundries and for more nearby positions are reported to be much better, the market generally continues dull and quatably unchanged.

Aluminum—Demand from automotive foundries is moderately better. Prices are unchanged.

Copper—Consumers have bought fairly sizeable tonnages at 7 cents. The market shows an undertone of strength. Producers continue to confer on curtailment of output.

Tin—Dull. Straits tin for spot delivery was offered at 22.80 cents at the beginning of the week's trading.

Lead—Demand heavier. Storage battery manufacturers more interested.

Zinc—Quiet and easy.

Offers New Finish

LOUISVILLE, Oct. 26—The Jones-Dabney Co. has announced a system of automobile finishing which does not involve the use of low viscosity nitrocellulose lacquers. The basis of the system is a finishing material called "Syntex," which can be applied by spraying, and which is said to produce a high lustre after baking, without the intervention of special polishing operations.

Sir James McKechnie

News comes from London of the death there on Oct. 12 of Sir James McKechnie, at one time managing director of Vickers, Ltd., of Barrow-in-Furness, at the age of 80. McKechnie was the originator of "solid injection" for Diesel engines, which now has replaced air injection to a large extent. Since

Lubricate Credits, Economists Urge

(Continued from page 695)

quired for withdrawal reserve in the banking institutions of this country to support nine-tenths of the transactions taking place in the forms of checks and other credit facilities. The other nine-tenths of the monetary gold is comparatively idle.

Should as little as \$200,000,000 in gold be transferred to the credit backing, it would stiffen the entire scale of commodity prices and should bring about an upturn of business. The machinery for this transfer is available in the Federal Reserve System, which could go out in the open market and purchase bonds, thus releasing this gold for credit expansion in industry and purchasing.

The majority of the speakers at the session were in agreement that the Federal Reserve System had fallen down in the present crisis, due probably to lack of sufficient courage.

A business depression has three phases: First, a prior inflation; second, a corrective paroxysm; third, a destructive era, which is a continuation of the corrective period. In the present depression, this third phase could have been lessened by prompt action on the part of the Federal Reserve System, but instead has been allowed to extend far beyond its normal period.

Ultimate recovery may come about by some fortuitous event such as a crop shortage, a war, or the accidental discovery of additional large supplies of gold, or it can be brought about by a deliberate policy on the part of the proper credit authorities, namely, the central banks of the various governments. The recently organized National Credit Corp. is a step in the direction of the deliberate policy of credit expansion, but its effect has not yet been sufficient to bring about the desired result.

Andre Citroen Sails

NEW YORK, Oct. 28—Andre Citroen sailed yesterday aboard the French liner Ile de France to France after a short visit in this country. While here M. Citroen visited Washington, Philadelphia and Detroit, but spent most of his time in New York.

White Promotes Seanor

The promotion of Harry E. Seanor to the position of vice-president of the Chicago Region of the White Co. has been announced.

Budd Gets License

NEW YORK, Oct. 27—Edward G. Budd Mfg. Co. has been granted the exclusive right to the manufacturing of a new machine for rayon yarns. These rights are granted under patents of the Furness Corp. of Gloucester, N. J.

Acetylene Meeting to Test Welding

CHICAGO, Oct. 26—A comprehensive discussion of methods for testing oxy-acetylene welded joints will be one feature of the thirty-second annual convention of the International Acetylene Association at the Congress Hotel, Chicago, Nov. 11-13.

At the weld-test session, Nov. 11 at 8.15 p. m., Prof. H. L. Whittemore of the Bureau of Standards will speak on the importance of tests to welders and to users and makers of welded products. There will be a demonstration of visual and stethoscopic tests; hammer, bending, tension and hardness tests; invisible-ray tests; specific gravity, compression and internal pressure tests.

Allis Reports Profit

NEW YORK, Oct. 27—Allis-Chalmers Mfg. Co. reports net profit for the first nine months of 1931 of \$1,212,773 or 95 cents a share on common stock. This compares with earnings of \$3,034,522 or \$2.41 a share for the corresponding period last year. Earnings for the September quarter were \$206,712 as compared with \$682,982 for the corresponding period of last year.

Checker Cab Profits

NEW YORK, Oct. 27—Checker Cab Mfg. Corp. reports net profits for the nine months ending Sept. 30 of \$22,973 after all charges. This is equivalent to 6 cents a share and compares with earnings of \$587,098 or \$1.56 a share for the corresponding period a year ago.

Yellow Coach Reports Loss

NEW YORK, Oct. 27—Yellow Truck & Coach Mfg. Co. reports net loss for the nine months ending Sept. 30, after provision for depreciation of \$1,893,332. This compares with a profit during the corresponding period of last year of \$1,053,431. Net sales during the period were \$20,659,471.

Budd Promotes Butler

E. M. Butler, who has been a member of the sales department of the Edward G. Budd Mfg. Co., Philadelphia, in charge of engineering changes, has been promoted to the post of chief inspector of the company. Mr. Butler has been associated with the Budd Company for 17 years.

Brake Linings Discussed at Clinic

Bendix Co. Sponsors Meeting of Thirteen Material Suppliers

CHICAGO, Oct. 26—More definite standards of brake lining manufacture and installation may result from a three-day "clinic" held recently at the Bendix plant in South Bend, Indiana, under sponsorship of the Bendix Brake Co.

The question of brake lining standards will be placed before the Asbestos Brake Lining Association for thorough research, it was decided by the 44 officials and representatives of 13 leading brake lining manufacturing concerns attending the clinic.

The association will be asked, as a part of its research work on lining and service standards, to put the results of its findings in working form for all service mechanics.

Many important problems pertaining to better servicing and adjustment of automobile brakes were discussed at the meeting and it is believed considerable progress was made toward placing brake service on a more uniform plane.

It was pointed out that since no uniform standards exist at present, no two mechanics in any two brake service shops obtain the same results with the same grade of lining.

The following firms were represented at the initial clinic: American Brake Materials Corp., Asbestos Mfg. Co., Asbestos Textile Co., Canadian Raybestos Co., Ferodo & Asbestos Company, Multibestos Co., Raybestos division of Raybestos Manhattan, Inc., Russell Mfg. Co., Thermoid Rubber Co., Union Asbestos & Rubber Co., U. S. Asbestos division of Raybestos Manhattan, Inc., Wagner Electric Corp. and World Bestos Corp.

September Vehicle Production Down

WASHINGTON, Oct. 29—Motor vehicle production in the United States in September declined to 140,566 units from 187,192 in August. The September output consisted of 109,087 passenger cars, 31,338 trucks and 141 taxicabs. In the first nine months of 1931 motor vehicle production was 2,119,188 units as against 2,909,130 in the corresponding period of last year.

The September output in Canada decreased to 2646 from 4544 in August and consisted of 2108 passenger cars and 538 trucks. In the first nine months of the current year Canadian production was 77,502 as compared with 138,622 in the corresponding period of last year, according to figures from the Bureau of the Census, Department of Commerce.

Wotowitch Tells Met Section S.A.E. How Company Fleets Should Be Managed

NEW YORK, Oct. 26—The passenger car as adapted for fleet use was the subject of the regular monthly meeting of the Metropolitan Section of the Society of Automotive Engineers, held at the American Woman's Association club house last week.

Richard A. Wotowitch of Henry L. Doherty Co. analyzed the problem as to whether the fleet should be company owned or made up of cars owned by individual salesmen. He pointed out that several factors must be considered in studying this question. In the last analysis, the matter must be decided as one of mutual responsibility and benefit to the company and the individual.

Following Mr. Wotowitch's discussion, a symposium of discussions on the question of the requirements for the fleet car as compared with the requirements of a car sold to the public was held. This symposium was headed by F. K. Glynn, who had charge of the program for the evening. The symposium was made up partially of letters in reply to a questionnaire which Mr. Glynn had sent out, and by extemporaneous remarks from the floor by persons called on by Mr. Glynn.

With the exception of three or four requirements, most of the needs for the fleet car, as designated by the contributors to this symposium, are also desirable attributes of the car for sale to the public. The possible exceptions were the feasibility of a unit replacement system for repair work, in-

terior upholstery designed to withstand the rough usage in carrying sample cases and advertising matter, and roomy carrying space in the so-called business coupe.

Other requirements stipulated include such items as sturdy steering mechanism, sturdy radiator, broad-band bumpers front and rear, ready accessibility to all parts of the motor, longer life, easier turning and various factors affecting the comfort of the driver, such as heaters in the colder climes, proper ventilation, adjustable driver's seat, freedom from drumming and care to prevent the escape of exhaust gases into the body of the car.

Following this symposium, John A. C. Warner, general manager of the Society of Automotive Engineers, spoke on the need for greater consumer research. The subject of his paper was "Why Won't the Car Manufacturer Give the Public What It Wants?" (See page 678, this issue.)

Following this talk, Mr. Warner showed some slides depicting some of the brilliant ideas suggested from time to time as to what the automobile should be like. After the slides, Mr. Warner had the curtain drawn back from the stage and presented to the admiring gaze of the audience the Met Section Ideal car of 1932. This car commanded the awe and admiration of all present until it crashed when Mr. Warner, after demonstrating its numerous advantages, hoisted his sylph-like form up on the running board.

Studebaker Profits 18c. on Common

**Nine Months
Net Profits
Reached \$2,496,125**

SOUTH BEND, IND., Oct. 27—Net profits of The Studebaker Corp. and subsidiary companies, after reserves for Pierce-Arrow minority stockholders' interest, for the quarter ending September 30, 1931, were \$466,770.62 as compared with \$514,006.68 last year. The amounts remaining for Studebaker Common, after preferred dividends, were 18c per share this year as against 20c last year.

Net profits for the first nine months, were \$2,496,125.59 this year as compared with \$2,772,708.85 last year. These provided \$1.09 and \$1.23 respectively, for the common stock.

The financial position of the Corporation as of September 30, shows substantial improvements since January 1 in quick assets, working capital, and in reductions of property investment account, current liabilities, minority stock interest, and Studebaker preferred stock. Working capital was increased to \$21,583,169.93 from \$19,438,646.60, with a ratio of quick assets to current liabilities of 5.89 per cent, the best in fifteen years.

Pierce-Arrow Reports Net Profit of \$226,435

BUFFALO, Oct. 27—Pierce-Arrow net profits for the nine months ending September 30, 1931, were \$226,435 as compared with \$1,308,748 last year. For the third quarter of 1931, operations showed a loss of \$195,277 as compared with a profit of \$278,070 for the same period last year.

Chromium Suit Decided in Favor of United

NEW YORK, Oct. 28—United Chromium, Inc., has won the decision in a patent litigation before Judge Edwin S. Thomas in the United States District Court, District of Connecticut, charging the International Silver Co. of Meriden with infringement of the patent relating to the process of chromium plating.

The patent is one drawn by Prof. Colin G. Fink, professor of electrochemistry at Columbia University, and now assigned to United Chromium. Patent number is U. S. Patent 1581188.

All claims of the suit were held valid by the decision and defendant's claim of prior art was denied. The decision ordered a decree for the plaintiff for an injunction, reference and accounting.

A spokesman for the defendants in the suit told *Automotive Industries* that no additional statement was to be made at the present time.

Sparks-Withington Adds Refrigerators

JACKSON, MICH., Oct. 27—Sparks-Withington Co., makers of automotive horns and radio sets, will begin the manufacture of electric refrigerators by Jan. 1.

Iowa Gas Consumption Up

DES MOINES, IOWA, Oct. 26—Motor vehicle fuel taxes in September amounted to \$1,301,220, compared with \$1,128,408 in September, 1930, and brought the total increase in tax from this source during 1931 to nearly \$850,000. Of the September income \$663,740 will go to the primary roads, \$460,000 to others.

Dodge Deliveries Gain Over 1930

DETROIT, Oct. 27—Retail deliveries of the New Dodge Six and Eight, in July, August and September, reached a total of 100.6 per cent of sales during the same three months in 1930, with trucks mounting to 103.8 per cent.

Chrysler Exports Showing Increase

DETROIT, Oct. 26—Exports of passenger cars built by Chrysler Corp. increased from 16.8 per cent to 19.3 per cent of the unit exports of the automobile industry (exclusive of Ford) during the first eight months of this year, as compared with the same period last year. In August alone exports of Chrysler amounted to 95.3 per cent of what they were in August a year ago and constituted 27.6 per cent of the exports mentioned above.

This year's increase in export sales has been largely due to improved demand in Scandinavian countries, England, Denmark, Holland and Belgium. The figures available thus far, however, include to only a small extent export shipments of the company's new Floating Power Plymouth, which did not really start until August.

In the first eight months of 1931 Chrysler Motors exported over 3000 trucks, and while this was only 69.5 per cent of last year, shipments to Europe alone increased 58 per cent.

Die Castings Extensively Used

NEW YORK, Oct. 27—Automotive designers probably have used die casting to a greater extent and for a longer time than any other group, according to a recent publication of the New Jersey Zinc Co.

Zinc die castings have been used by them for a number of years for carburetors, fuel pumps, speedometers, hardware, windshield frames and radiator caps.

Radiator moldings and ventilator hoods are some of the latest parts executed in die-cast form. Photographic views of numerous die cast-parts for automobiles, etc., are shown in the publication referred to, which bears the title, "Zinc Die Castings."

Inaugurates Hauling Service

CHICAGO, Oct. 27—To compete with truck hauling, the St. Louis Southwestern Railway, known as the Cotton Belt, has inaugurated overnight delivery in a 590-mile zone from St. Louis. All southwestern roads began free pickup and delivery service Oct. 1, but the Cotton Belt has gone a step farther. Installation of a new train, operated on a passenger schedule makes possible a shipment reaching Shreveport, La., by noon the next day. Fast fleets of trucks are in readiness at each of seven stops. Shippers who deliver goods at track are refunded five cents a hundredweight.

Hupp Reports Loss

DETROIT, Oct. 26—Hupp Motor Car Corp. has reported for third quarter ended Sept. 30, 1931, net loss of \$896,184, compared with net loss of \$458,388 in the same quarter last year.

Net loss for the nine months ended Sept. 30 was \$1,973,294, compared with net profit for the same period last year of \$105,672.

Graham Deliveries Gain

DETROIT, Oct. 26—Graham-Paige Motors Corp. has reported retail deliveries to date this month, exceeding the October, 1930, figure, and maintaining the level attained by new-car shipments in September, which was the first month this year to surpass the corresponding month of 1930 in the number of new cars leaving factory.

Adopts Double-Labor Shift

DETROIT, Oct. 27—Charles S. Mott, vice-president, General Motors Corp., has announced that a double-shift labor program will be adopted wherever feasible in the plants of the corporation. It is understood that at present the plan is being put into effect in several departments of Buick and Chevrolet.

+ + CALENDAR + + OF COMING EVENTS

SHOWS

Olympia Truck Show, London..Nov. 5-14
 Passenger Car Show, Glasgow..Nov. 13-21
 Salon, New York City.....Nov. 29-Dec. 5
 Motorcycle Show, London..Nov. 30-Dec. 5
 National Automobile, New York..Jan. 9-16
 San Francisco, Automobile.....Jan. 16-23
 Newark, N. J., Automobile.....Jan. 16-23
 Cincinnati, Automobile.....Jan. 17-23
 Milwaukee, Wis., Automobile...Jan. 17-23
 Philadelphia, Automobile.....Jan. 18-23
 Louisville, Ky., Automobile....Jan. 18-23
 Boston, Mass., Automobile.....Jan. 23-30
 Minneapolis, Minn., Automobile..Jan. 23-30
 Hartford, Conn., Automobile...Jan. 23-30
 Detroit, Automobile.....Jan. 23-30
 Montreal, Automobile.....Jan. 23-30
 Baltimore, Automobile.....Jan. 23-30
 Pittsburgh, Pa., Automobile...Jan. 23-30
 St. Petersburg, Fla., Automobile, Jan. 28-31
 National Automobile, Chicago, Jan. 30-Feb. 6
 Salon, Chicago.....Jan. 30-Feb. 6
 Washington, D. C., Automobile Jan. 30-Feb. 6
 Cleveland, Automobile....Jan. 30-Feb. 6
 Springfield, Ill., Automobile.....Feb. 4-6
 St. Paul, Automobile.....Feb. 6-13
 St. Louis, Automobile.....Feb. 7-12
 Denver, Colo., Automobile.....Feb. 8-13
 Peoria, Ill., Automobile.....Feb. 9-14
 Salon, Los Angeles, Calif.....Feb. 13-20
 Kansas City, Automobile.....Feb. 13-20
 Mankato, Minn., Automobile...Feb. 17-20
 Holyoke, Mass., Automobile...Feb. 18-22
 Des Moines, Iowa, Automobile..Feb. 21-26
 Wichita, Kans., Tractor and Power Equipment.....Feb. 23-26
 Salon, San Francisco, Calif..Feb. 27-Mar. 5

CONVENTIONS

National Association of Finance Companies, Chicago.....Nov. 17-18
 American Society Mechanical Engineers—Annual meeting, New York City.....Nov. 30-Dec. 4
 American Roadbuilders Association, Detroit, Mich.Jan. 11-14, 1932
 S.A.E. Annual Dinner, New York City, Jan. 14
 S.A.E. Annual Meeting, Detroit, Mich., Jan. 25-29

S.A.E. SECTION MEETINGS

Philadelphia.....Nov. 12

Lightest Aero Diesel Undergoes French Tests

PARIS, Oct. 20 (by mail)—Tests now are being made of a new Clerget seven-cylinder radial Diesel engine by the Department of Tests, French Air Service. The engine is rated at 350 hp., but is said to have developed 419 hp. on the brake, although it weighs only 616 lb. or about 1.47 lb. per hp.

If this report is correct, it is by far the lightest Diesel aircraft engine yet built. The speed of operation is 1800 r.p.m. Another Clerget engine with 14 cylinders, which consists essentially of two of the seven-cylinder engines on the same crankshaft, is under construction.

Many Foreign Car Dealers Expected at New York Show

NEW YORK, Oct. 28—Invitations to participate in the International Day program, which will be one of the features of the New York automobile show in January, were being mailed Friday by the National Automobile Chamber of Commerce to 3500 highway officials, automobile dealers and prominent individuals in foreign countries.

The International Day program will be held in the New York headquarters of the organization Monday, Jan. 11.

Inspection of the exhibits at the Motor Show in Grand Central Palace will follow a program of addresses by domestic and foreign leaders in the auto industry.

Visitors from abroad are also being invited to attend the annual automobile show banquet in the Commodore Hotel on Tuesday, Jan. 12.

American Forging Declares 15c Share

PONTIAC, MICH., Oct. 26—Directors of the American Forging and Socket Co. have declared the regular quarterly dividend of 15c per share on common stock, payable Nov. 2 to stock of record Oct. 20.

Gleaner Reports Assets

CHICAGO, Oct. 26—Receivers' statement of condition of the Gleaner Combine Harvester Co., in the form of a balance sheet of Aug. 31, 1931, shows total assets of \$5,241,725, compared with a total of \$6,517,285 shown in Aug. 31, 1930, statement of the company, the last made public before the appointment of receivers.

Current assets were shown in the 1931 statement at \$3,672,147 and current liabilities at \$2,413,586, compared with current assets and liabilities as shown in the pre-receivership of \$5,399,113 and \$2,529,258 respectively.

Accounts, notes and acceptances receivable have been reduced to \$2,499,792 in the recent balance sheet, compared with \$3,552,309 in the August, 1930, statement. Inventories have been lowered to \$890,396 from \$1,131,444.

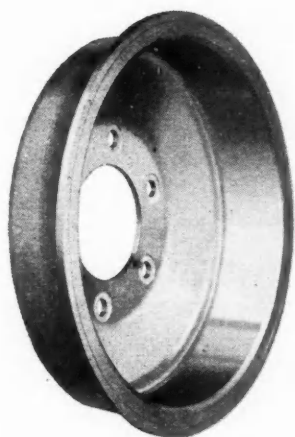
Statement of current liabilities for Aug. 31, 1931, includes receivers' certificate of \$195,000 outstanding, bank loans of \$342,410, and payables the A.B.C. Corp. of \$1,689,645. Equity is shown at \$1,653,649.

United Carr Profit 41c

NEW YORK, Oct. 26—United Carr Fastener Corp. and subsidiaries report net profit for the nine months ended Sept. 30 of \$103,976 or \$0.41 a share, as compared with \$49,421 or \$0.19 a share for the corresponding period a year ago. Earnings for the third quarter were \$27,536 or \$0.11 a share, compared with \$3,050 or \$0.01 a share for the third quarter of last year.

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B R A K E D R U M S

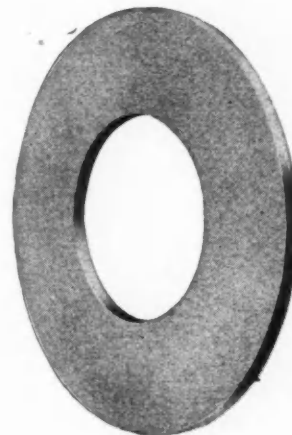
The application of Gunite—the pure, air furnace, pearlitic iron—to brake drums over four years ago, met with instant acceptance. Graphitic content makes braking smooth *always*; 50,000

pounds tensile strength prevents distortion, gives new design liberties. Thirty-three American automotive manufacturers use Gunite Cast Brake Drums as original equipment . . . replacing pressed steel and alloy iron drums. You should learn the facts about Gunite drums. Send for the complete story . . . no obligation.

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Clutch pressure plates are subjected to severe abrasive action. This abrasion plus the heat generated causes cracking, heat checks, and deformation in ordinary

plates. Clutch manufacturers have found in tests that plates of Gunite withstand abuse that burns up ordinary and alloy cast irons in a comparatively short time. Gunite's pearlitic structure adds wear and increases strength. Tensile strength is 50-60,000 pounds per square inch . . . Brinell hardness, 200, a hardness due to *toughness*, which does not decrease machinability. Investigate Gunite for your product.



R O C K E R A R M S

Manufacturers of internal combustion engines are replacing steel forged rocker arms with rocker arms of Gunite. Contact tips are chilled to add wear. Gunite's strength and rigidity are important factors in this application. Substantial savings have been effected by the reduction in machining costs alone. Oil pockets, or recesses which reduce weight, may be cast integrally, eliminating a costly machining operation. Take a critical look at your product. Gunite may be the means of cutting your costs materially.



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The accuracy, precision and high speed of modern machine tools depends largely on the strength and rigidity of the metal used in their construction. Because Gunite is stronger and more rigid without adding weight, a very significant and constantly increasing percentage of automotive machine tools employ Gunite castings for important integral parts weighing from 1 to 5,000 pounds. The machine tool industry knows Gunite . . . do you?

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THE PEARLITIC IRON

ADDS STRENGTH . . . ADDS WEAR . . . CUTS COSTS

Engineers Need a Post-Graduate Course in Consumer Research

(Continued from page 679)

In addition to obtaining technical information for factory use the engineer often advises and helps field representatives with important prospects. One of these prospects recently asked an automobile salesman how much torque his engine had. The salesman replied, "I'm glad you asked that question. Our engineers at the factory recently made a careful study of torque, tested it completely and decided not to put it in any of our cars." What a prospect this salesman turned out to be for a "going over" by a competent engineer with a sales slant and a bag full of legitimate engineering talking points for salesmen to use when, as and if required!

cannot be derived from the dealers and salesmen who work continuously with the public. Certain facts *can* be and *are* being obtained from these sources, but the practice has obvious limitations. The best dealers and salesmen could not sell their product so enthusiastically if they were always trying to see how to improve it. Salesmen who redesign automobiles are rarely useful to anybody. An untrained analyst is more than likely to reflect his personal reactions rather than those of his customers.

A little study will reveal many possibilities for obtaining very helpful and constructive criticism from users. Customer complaints should be used for the good of the order—not for filing purposes only.

One way to learn what's wrong with your car is to ask the man who owns or sells a competitive make. To quote Norman Shidle, directing editor of the Chilton Class Journal Company, "Contacts with retail maintenance departments of rival dealers and independent repair shops are worthwhile. The general trade opinion of a given car is highly important and often practical. In any case, the dealer and repairman are considered to be authorities by John Public who usually accepts their advice and ideas concerning things automotive."

Effective cooperation between the service and engineering departments is one of the greatest assets that a company can possess. Service records and special service reports from the field are of inestimable value to engineering if they are properly obtained and applied. Too often, however, the utility of this type of information suffers from a lack of understanding between the two departments. With a proper cooperative relationship, the service forces in the field can and should reflect general conditions for engineering consideration; further, the service department should be in a position to procure answers to specific questions relating to the consumer aspects of the engineering department's work.

Experience of the past offers a useful gage but it must be applied with intelligence. A feature that went well on last year's line may offer no buying incentive today. This is particularly true in matters of style. A keen nose for atmosphere, trends and changing conditions should adorn the face of the sales executive. Admittedly, cars are not always

bought on their merits; but this does not lessen the engineer's responsibility to do his best in the way of consumer engineering.

Someone has said that "change and development represent the price paid for survival." Apparently, certain industrial managements do not believe this saying, and their lack of belief may explain why some so-called research departments are in reality nothing more than "trouble shooting" units. Such managements do not carry on research and development for the future. Their immediate reaction to suggested improvements is likely to take the form of an exposition indicating how hard the factory strives to save half a cent here and there on the cost of each unit. Consequently, they say, "Any added expense is out of the question." This line of reasoning is permissible only up to a certain point. The "half-cent philosophy" has been known to becloud the possibilities of spending a dollar more to make the product worth a hundred dollars more in the eyes of the public.

One of our foremost engineers holds that we are so tied up with tradition and past practices that we are unable to deviate and progress. To illustrate his thought, suppose we take a quick glance at the front compartment of a modern automobile and measure it, not according to how it has always been but in terms of safe, comfortable, easily controlled transportation. What a bag of tricks we find there! Pedals, buttons, handles and gadgets galore! Of course, everybody's doing it; but isn't this reason enough for some courageous soul to eliminate a few of these items in the interest of the millions of owners who want the finest in transportation instead of tricks? Why not free our cars of their nuisance features? Who enjoys the choke?

Ideally, the operators of our cars, especially the ladies, should not be called upon to exert appreciable force in order to control the vehicle. The process should be as simple and easy as the pressing of a button. Why not eliminate or combine some of our controls and make those that remain easily operable? The public will give us tangible evidences of appreciation for these increments of comfort, ease and safety.

FELLOWS METHODS ASSURE

Every phase of Fellows Gear finishing is based on the fundamental principle of gear tooth generation. Because that control is exact to a degree not attained in any other production method, you can duplicate a successful gear design and quiet gear operation indefinitely.

The only sound accounting of gear production cost is PER ASSEMBLED UNIT O.K.'D AFTER TEST for quiet operation. On that basis Fellows Methods are preferred in the gear shops of this and foreign countries.

The maximum in production economy is achieved by using complete Fellows equipment. The safety factor of placing undivided responsibility where it is accepted without qualification is dollars-and-cents economy in the long run.

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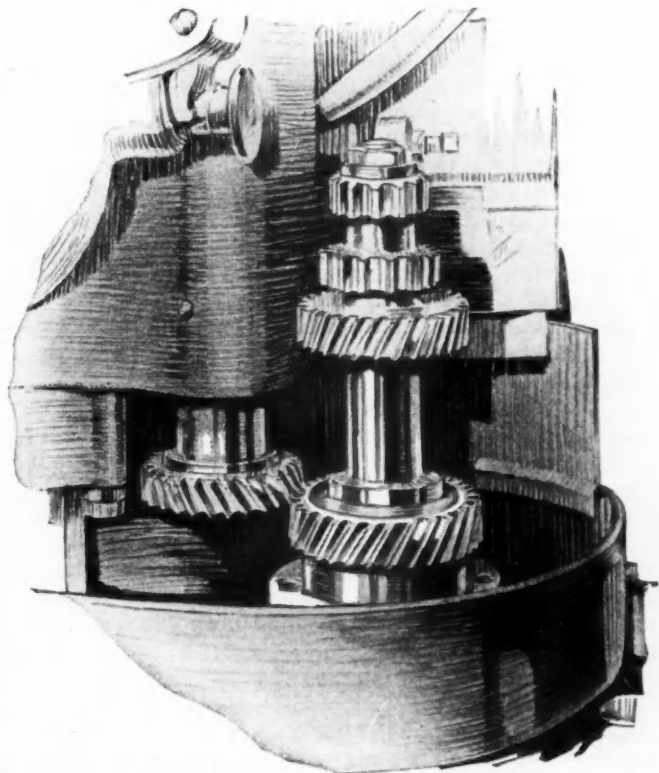
Positive Cutter Control

Continuous Rotating Indexing

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Fellows Gear Shaper Methods afford complete control at all stages of gear cutting.

October 31, 1931

Events in the Development of the Automotive Industry In the U. S. Are Reported by German Author

(Continued from page 689)

profits from war contracts in it. The fact of the duPonts' participation in Chevrolet became known and added further to the public favor of the shares.

Durant then resolved to try to regain control of General Motors, which had not been doing so well under the management of the banking group. He offered to exchange one share of Chevrolet Motor Company stock for five shares of General Motors, and the offer was widely accepted by General Motors stockholders, even though the management advised against it. It is said that when they saw Durant gaining, some of the large interests in General Motors, who were opposed to his return to control, threw their holdings on the market, thereby helping the plan along. In the spring of 1916 Durant had accumulated a sufficient number of G.M. shares to enable him to assume control of the corporation as president once more, this time with the powerful financial backing of the duPont interests.

Durant's return to power was signalized by the putting into effect of a rapid expansion program. Chevrolet Motor Company was absorbed by General Motors, and from 1915 to 1916 production of the corporation increased from 76,000 to 132,088 units, while earnings were practically doubled. The growth of the corporation continued for four years, among other acquisitions being the Scripps-Booth Automobile Company and the Samson Tractor Company, but in 1920 another crisis had to be met.

The year started auspiciously, and as a consequence the various units of the corporation laid down very ambitious production programs, producing largely for stock, with the result that by April 30 of that year the merchandise account had reached a value of \$168,000,000. During the summer the demand was unusually low and the number of cars in stock continued to increase so that in October the merchandise account had reached the unprecedented figure of \$209,000,000. As a result of this great accumulation of momentarily unsalable stocks, quotations of General Motors shares, which during 1919 had risen from \$123.50 to \$307.75, in May, 1920, began to drop rapidly. In the spring of 1920 the shares were split up 10 for one, and in December, 1920, the new shares were quoted on the Stock Exchange as low as \$13.25.

Durant, who had faith in the stock, endeavored to stem the decline by purchases for his own account and by organizing a syndicate for supporting the stock, but when the quotation fell below \$15.00 he reached the end of his rope and had to give up. On November 22, 1920, he announced that he had sold a large batch of stock to the duPont Securities Corporation, and a week later General Motors made the announcement that Durant had resigned as president and had been succeeded by Pierre S. duPont.

In the book these events are traced in considerably greater detail.

In the last section of the book, dealing with the most recent period of the industry, during which marketing problems were paramount, the following topics are discussed: Efforts for broadening the market by pressure

on dealers, the introduction of the instalment plan, and development of export markets; the used-car problem; efforts looking to the acquisition of related industries; reorganization of the Ford Motor Company (for Model A production); failures in the automobile industry and groupings for the control of the market; market conditions in 1929-1930; reaction of competition for the market on the technical structure of the industry.

Serviceman Says Joint at Roof Rail Is Weakest Point in Body

(Continued from page 693)

wear out the dovetails, and they then make a very unpleasant noise when being closed. There is room for great improvement in the hinges, as regards both stability and appearance. The door locks in general use are the same as were employed years ago, comprising handles, springs, a plunger and a piece of sheet metal serving as a guide for the plunger. The sliding parts wear out for lack of oil. This plunger lock has no adjustment for wear on the door bumpers or wear in the lock itself. With this type of lock many accidents are caused because the driver drives away thinking he has locked the door when actually it is not firmly locked, and the door catches against some stationary object. A door lock that takes up the wear on the door each time it is slammed close has been placed on the market recently.

Body squeaks in the majority of cases are due to lack of insulating material between wood and metal parts. In some bodies, in order to eliminate squeaks, it is necessary to remove the panels and wrap the wood with friction tape. Quite often a squeak can be eliminated by tamping cotton between the pillar and the metal.

Automatic Machine Replaces Four Lathes

(Continued from page 685)

tance; automatic dwell to secure the proper facing operation, and then automatic rapid return traverse to the rear or starting position, and stop, ready for another cycle to be engaged.

The table of the machine is in the form of a six-sided indexing drum, mounted in large Timken taper roller bearings. The drum table indexes readily by hand and locates itself properly at each of the six stations. A locating and holding fixture, also designed by the Rockford Drilling Machine Co., is mounted on each side of this drum table. Hardened and ground steel guide bushings for guiding the cutting tools are incorporated in the table-support brackets.